ENGINEERING NEWS-RECORD

SEVENTY-NINTH YEAR OF PUBLICATION

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★ DENSITY CURRENTS IN RESERVOIRS

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A McGRAW HILL PUBLICATION

"At the Waldorf-Astoria, we're replacing pipe runs with Wrought Iron"

says THOMAS J. BARRETT,
Building Superintendent

MR. BARRETT'S insistence on durability in steam return lines at the famous Waldorf-Astoria is an economy measure that pays off not only in lower maintenance but also in guest room availability.

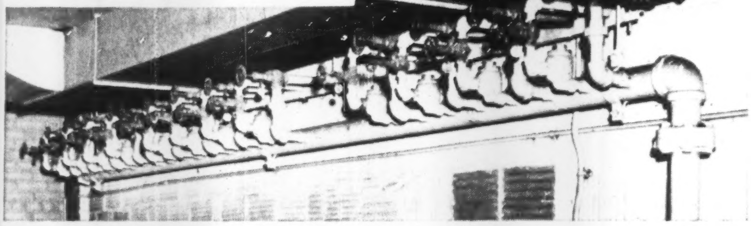
In all hotels, steam return failures can take a large share of the maintenance budget dollars. But that would be only part of the cost story at the Waldorf. If one steam return fails, from 25 to 30 guest rooms are removed from the reservation list until the piping has been repaired. As a safeguard against this costly result of premature pipe failure, the Hilton Management has standardized on wrought iron pipe for all horizontal and vertical steam return replacements.

The wisdom of this choice is supported by outstanding wrought iron durability records in steam return lines in industrial, commercial and institutional buildings in every section of the country. Architects, engineers and designers, well aware that corrosion cannot be eliminated as a factor influencing pipe service life in steam return lines, even under the best operating conditions, are regularly specifying wrought iron pipe for the service. The continued acceptance by these professions is the best possible evidence of wrought iron pipe's ability to last longer, at lower cost per year.

If you are concerned with steam return piping, and would like a detailed report on how wrought iron can serve you better, write our Engineering Service Department. Your request will be handled promptly.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Department: New York, N.Y.

THOMAS J. BARRETT
Building Superintendent



BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON
WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

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All-Weather, Sure-Grip—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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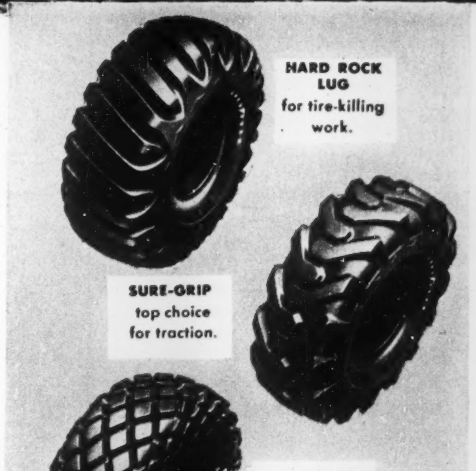
Here's why so many contractors say the best tire buy is a Goodyear:

Goodyear has built and sold over 600 million pneumatic vehicle tires *alone*—more tires for more specific uses than anyone else on earth. That is because the public has learned from experience that Goodyear tires are standout in all-round performance—*that Goodyears give you extra dependability, extra safety, extra mileage!*

So when you buy or specify Goodyear, you get all this EXTRA value without extra cost! Let your dealer prove it to you. Goodyear, Truck Tire Dept., Akron 16, Ohio.

FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!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AND MONEY

March 23, 1953

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Long Island City 1, N.Y.

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Yours very truly,
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Vice President

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ABP Member ABC

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Publisher

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Check the names of the contractors in your area. Note that a high percentage of the successful contractors—contractors who have grown and made money—contractors near you and over the breadth of the country—have bought Northwests year after year. Here on this page is listed only a small percentage of the well-known names who for over 30 years have made one out of every three Northwests sold a repeat order. We wish we could list them all!

Northwest owners get the output and service *you are looking for.* Follow the Northwest Crowd and make money.

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Has Your Shovel Stood the ROCK TEST

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

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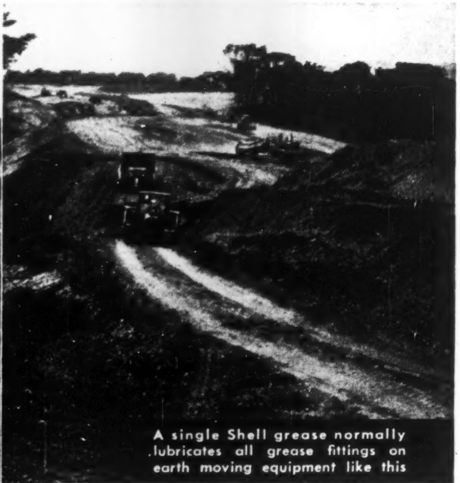
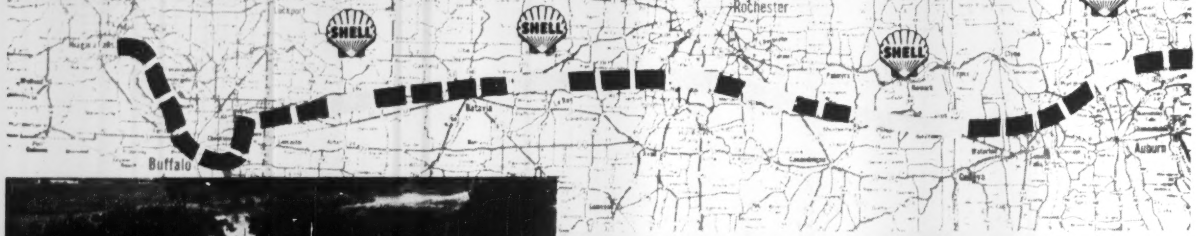
Shell crankcase lubricants keep heavy duty tractors on the job for S. J. Groves & Sons: 5,000,000 cu. yd. grading and paving contracts



A single Shell grease normally lubricates all grease fittings on earth moving equipment like this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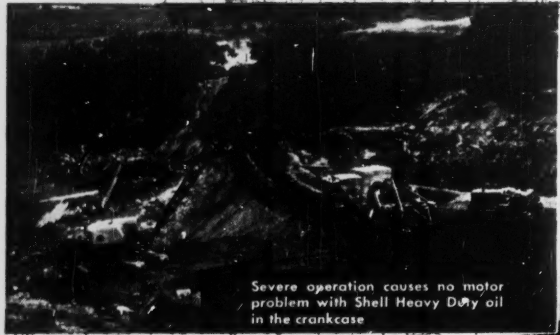

Severe operation causes no motor problem with Shell Heavy Duty oil in the crankcase

Shell E. P. Gear Lubricant takes the punishment during rough going on steep grades

Arute Bros., Inc. depend upon the "stay put" qualities of Shell's Multi-Purpose Grease for continuous heavy duty work

. . . 1 out of every 3 construction miles uses SHELL PRODUCTS exclusively

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Products that can win the unqualified preference of such responsible and efficient operators must have what it takes . . . and Shell products *have* it . . . plenty!

Most popular on the Thruway, and equally popular wherever heavy duty engines operate, Shell lubricants keep on protecting, defying wear, and keeping maintenance costs at rock bottom. Why not specify Shell for your equipment?

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2½ cu. yd. Shovels thrive on Shell Heavy Duty Lubricants under extremes of load conditions

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Greater stability not only lets you handle heavy loads with less danger of tipping strains, but also enables you to use your power more freely — gives you the added capacity to get more done in a day's work. Rolled alloy steels, welded throughout, give you the structural strength to take it in stride.

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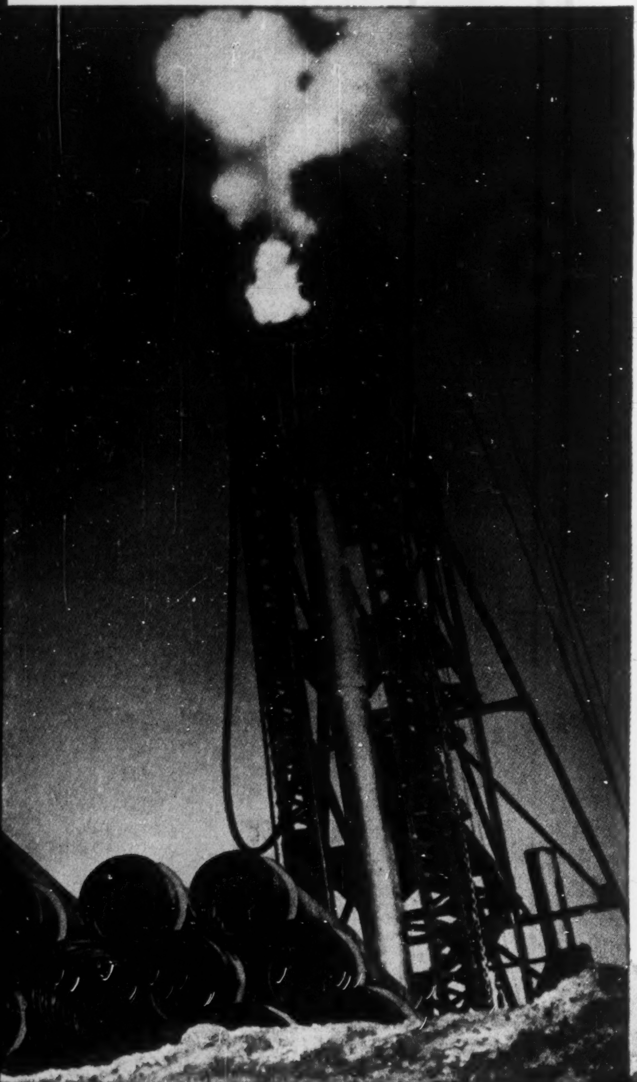

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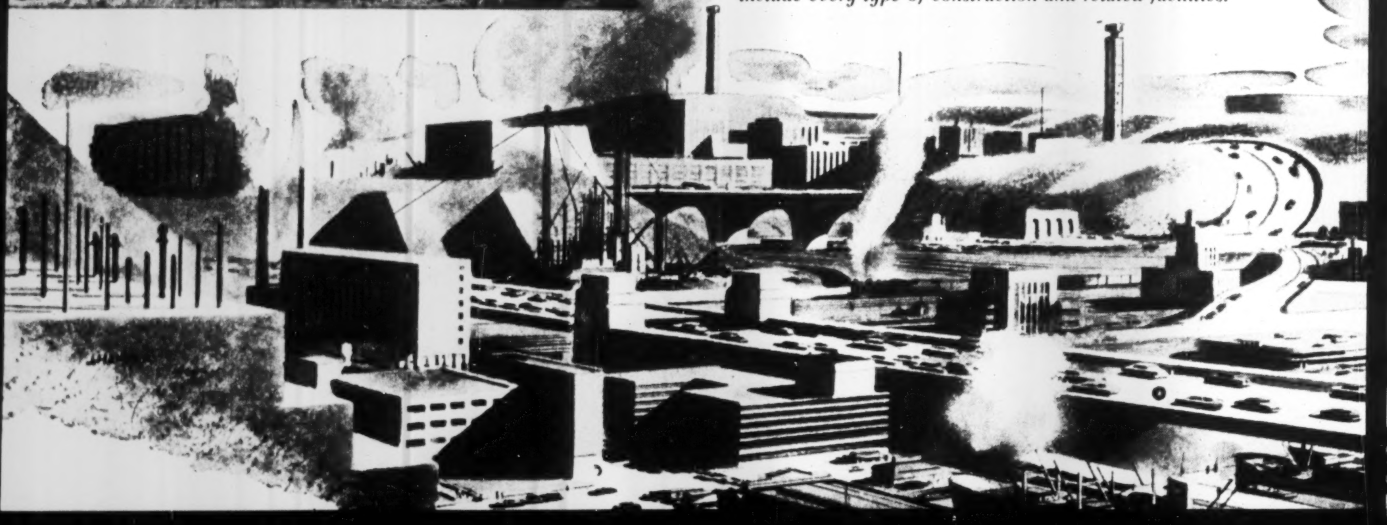

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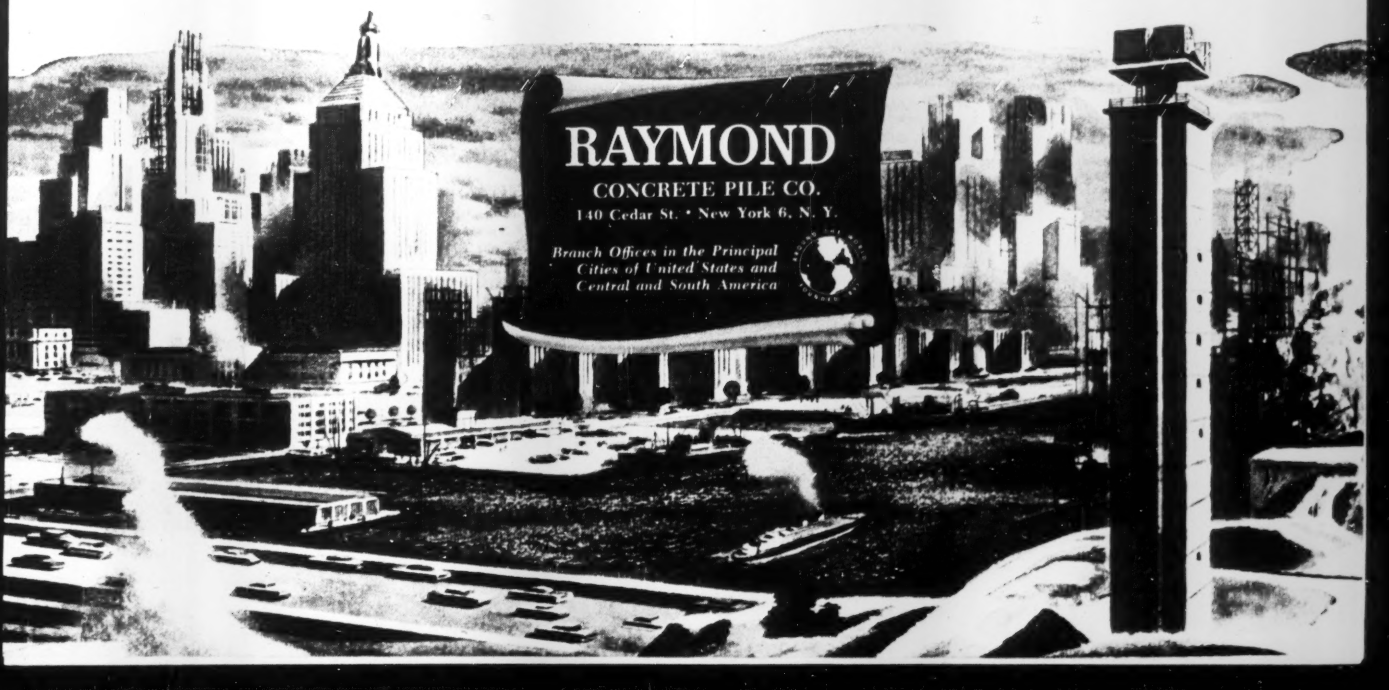

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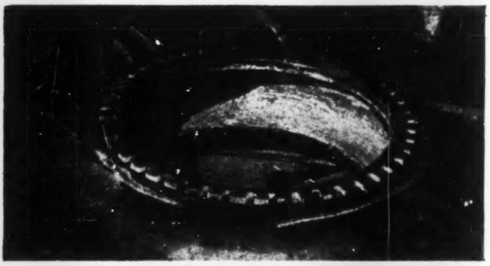
HIGH ALLOY CONTENT

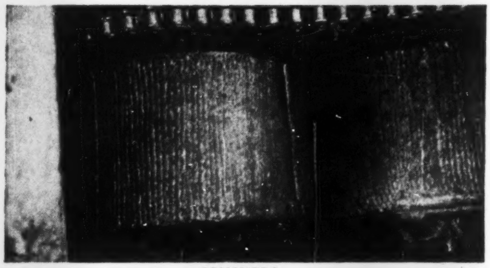
EXCELLENT ABRASION RESISTANCE

LOW COST



DREDGE PUMP CASINGS AND EQUIPMENT

POWER SHOVEL BUCKETS



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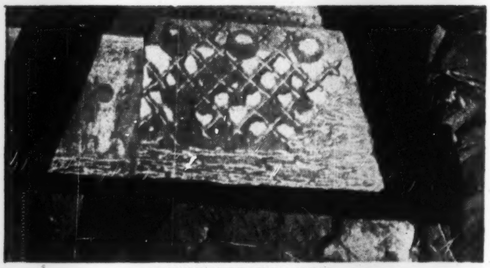


BULLDOZER END BITS

TYPICAL APPLICATIONS

Dredge Pump Casings & Equipment • Power Shovel Buckets Crushers • Grader End Bits • Elevator Buckets • Grader Blades Scraper Blades • Scarifier Teeth • Road Rippers • Asphalt Mixer Paddles • Paving Agitator Blades • Hammers • Dump Truck Bodies, etc.

READER COMMENT

Inspection insurance

SIR: Your editorial about the recent accidental collapses of freshly poured concrete structures (ENR Oct. 22, 1953, p. 76) has very sensibly pointed to possible causes of such accidents.

As to other ways to eliminate or at least diminish the risks of such accidents, I think a very efficient one would be the setting up by insurance companies of inspection organizations which would act as their technical representatives and supervise on their behalf all phases of construction work.

The contractors through adequate insurance policies would be protected, and the insurance companies' risks would be much lessened.

Such organizations have existed in France (Bureau Veritas C.C.I. Dept. & Bureau Securities) from the time that a series of mishaps, somewhat similar to those which have plagued this country, happened in France around 1928.

To my knowledge, this setup has worked satisfactorily. Contractors and architects have adjusted themselves very rapidly to the interference of the so-called "Bureaux de Controle." This relieves them of a considerable potential burden.

Incidentally, it should be noted that French building codes deal exclusively with sanitation requirements and architecture-urbanism regulations. They do not interfere with stability and structural problems as far as construction of private property is concerned. However, despite various differences, such as these, in the basic legislation between the two countries, I am confident that a policy along these lines would prove beneficial to all concerned.

G. L. BLANCHARD
Chicago, Illinois

Position re-emphasized

SIR: Your issue of Oct. 22 carried a discussion of the Miami meeting of the FSIWA on p. 23 in which I am reported as suggesting that "industry could well offer to pay cost of extra treatment it might cause in the downstream waterworks; rather than bear the cost of waste treatment that would abate pollution of the river." Perhaps I am over-sensitive to shades of meaning, but it seems to me that the statement suggests that I am in favor of polluting streams. Such is not the case.

The situation which I discussed was one in which only the water plant was affected. Natural purification and dilution taking place below the water plant successfully conditioned the stream water so that other users were not affected. I certainly do not advocate a practice of treating influents rather than effluents.

H. L. JACOBS
Engineering Service Division
E. I. du Pont de Nemours & Co.

Demolition done

SIR: Concerning the picture at bottom of pg 45, ENR, Nov. 26, 1953—"More to be done"—this tenement building, with the view of the capitol dome above, and all surrounding buildings were demolished several years ago, and the ground is now a landscaped front yard of the capitol.

G. H. HERROLD
St. Paul, Minn.

CALENDAR

American Road Builders Association, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., Jan. 5-7.

National Constructors Association, annual meeting, Hotel Commodore, N. Y. City, Jan. 12-14.

Highway Research Board, annual meeting, National Academy of Sciences Building, Washington D. C., Jan. 12-15.

National Association of Home Builders, annual convention and exposition, Conrad Hilton and Sherman hotels, Chicago, Jan. 17-21.

N. Y. Section AWWA, winter luncheon meeting, Commodore Hotel, N. Y. City, Jan. 19.

Land surveyors conference and exhibition, University Commons, Rutgers University, New Brunswick, N. J., Jan. 23.

Mason Contractors Association of America, Sherman Hotel, Chicago, Jan. 24-27.

Conference on Prestressed Concrete, University of Toronto, Toronto, Ont., Jan. 28-29.

Associated Equipment Distributors, Waldorf Astoria Hotel, N. Y. City, Jan. 31-Feb. 4.

Association of Asphalt Paving Technologists, Kentucky Hotel, Louisville, Ky., Feb. 1-3.

Ohio Water Clinic Conference, Ohio State University, Columbus, Feb. 11-12.

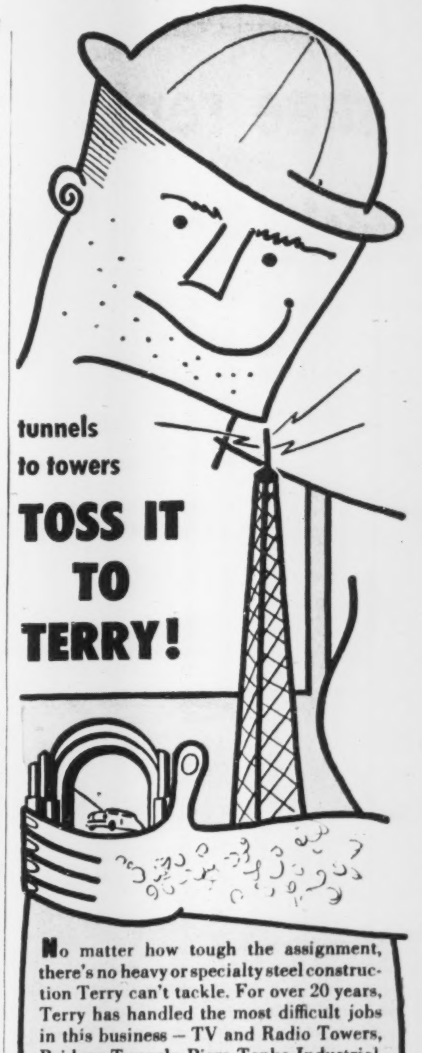
California Industrial Safety Conference, Palace Hotel, San Francisco, Feb. 11-12.

N. J. section American Water Works Association, winter meeting, Essex House, Newark, N. J., Feb. 16.

Golden Anniversary Convention, American Concrete Institute, Shirley-Savoy Hotel, Denver, Colo., Feb. 22-25.

American Concrete Agricultural Pipe Association, Fairmont Hotel, San Francisco, Calif., Feb. 24.

American Concrete Pipe Association, annual convention, Fairmont Hotel, San Francisco, Calif., Feb. 25-27.



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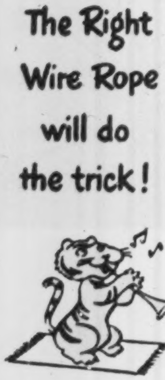
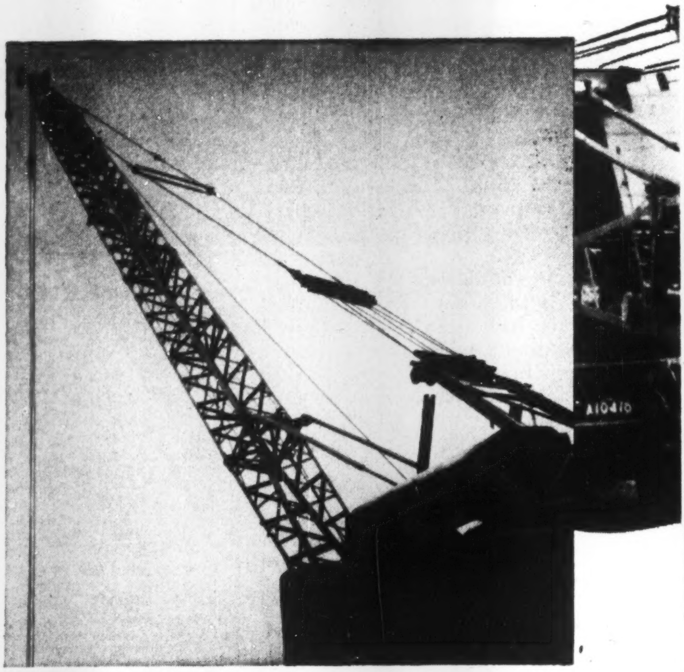
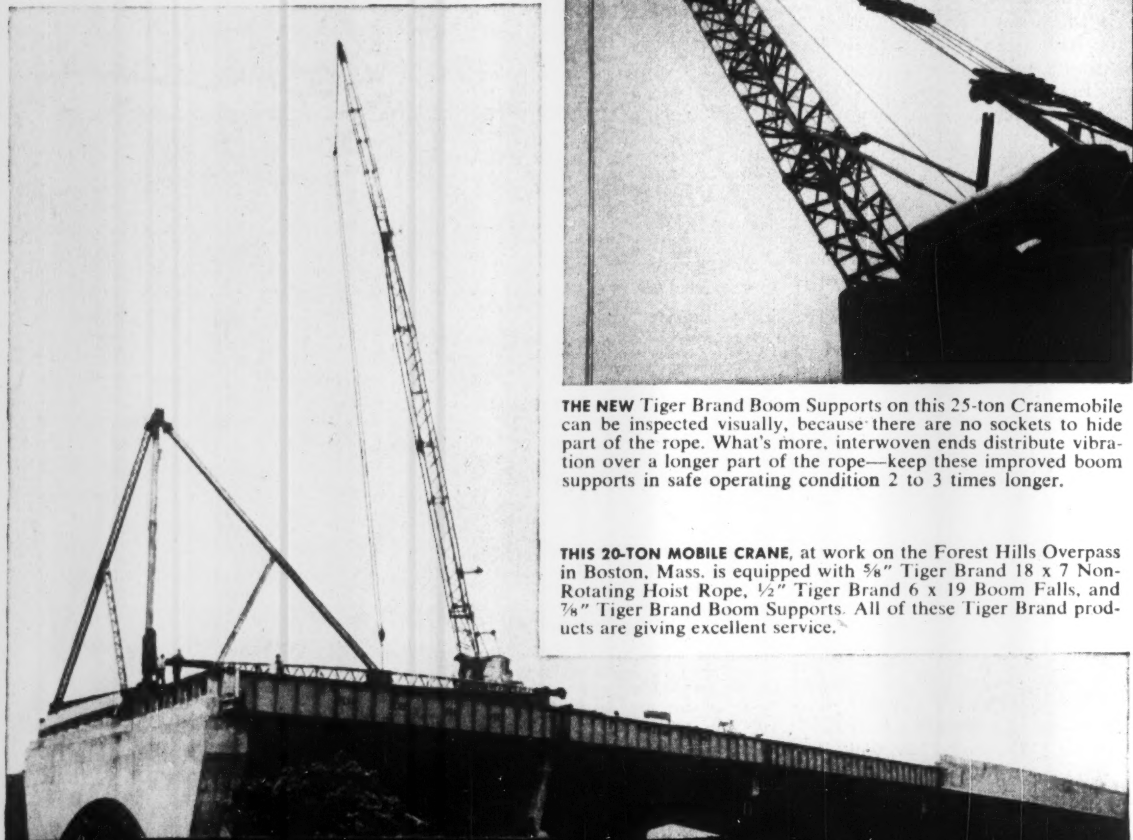
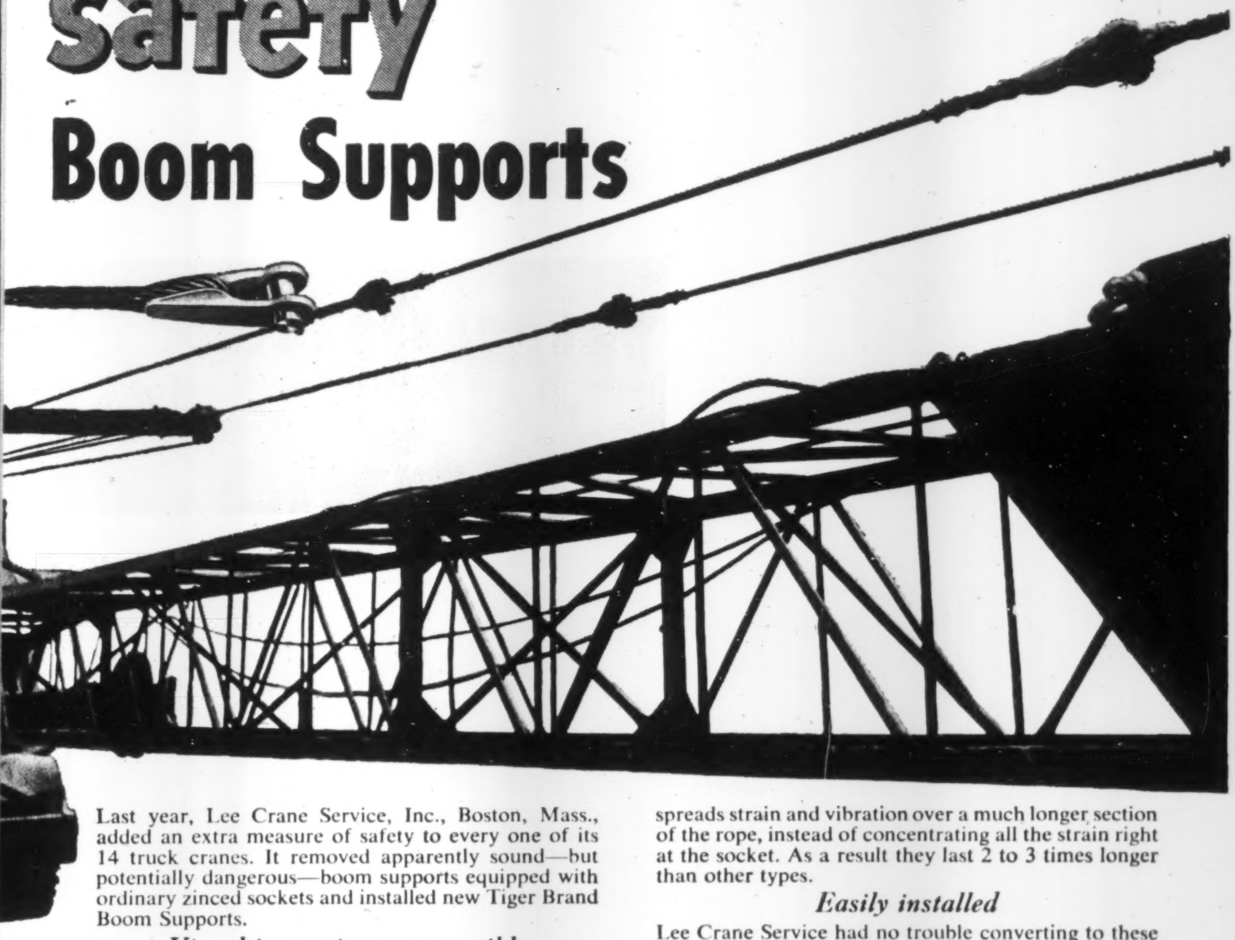




THE NEW Tiger Brand Boom Supports on this 25-ton Cranemobile can be inspected visually, because there are no sockets to hide part of the rope. What's more, interwoven ends distribute vibration over a longer part of the rope—keep these improved boom supports in safe operating condition 2 to 3 times longer.



THIS 20-TON MOBILE CRANE, at work on the Forest Hills Overpass in Boston, Mass. is equipped with ⅝" Tiger Brand 18 x 7 Non-Rotating Hoist Rope, ½" Tiger Brand 6 x 19 Boom Falls, and ⅞" Tiger Brand Boom Supports. All of these Tiger Brand products are giving excellent service.



safety Boom Supports

Last year, Lee Crane Service, Inc., Boston, Mass., added an extra measure of safety to every one of its 14 truck cranes. It removed apparently sound—but potentially dangerous—boom supports equipped with ordinary zinced sockets and installed new Tiger Brand Boom Supports.

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"These Tiger Brand Pendants completely eliminate the use of sockets. As a result, we can see and inspect *every* part of the rope. If any wires are broken, we can replace the pendant before a failure occurs. In that way, we can be sure that every one of our booms is completely safe."

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Tiger Brand Boom Supports last longer than the old-fashioned socket type, because each end of the wire rope is tightly and permanently interwoven. This spreads strain and vibration over a much longer section of the rope, instead of concentrating all the strain right at the socket. As a result they last 2 to 3 times longer than other types.

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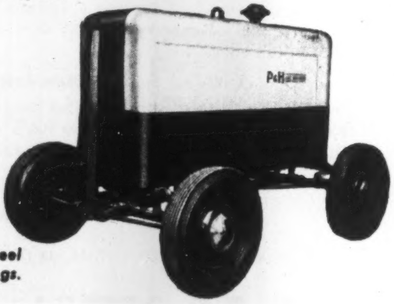

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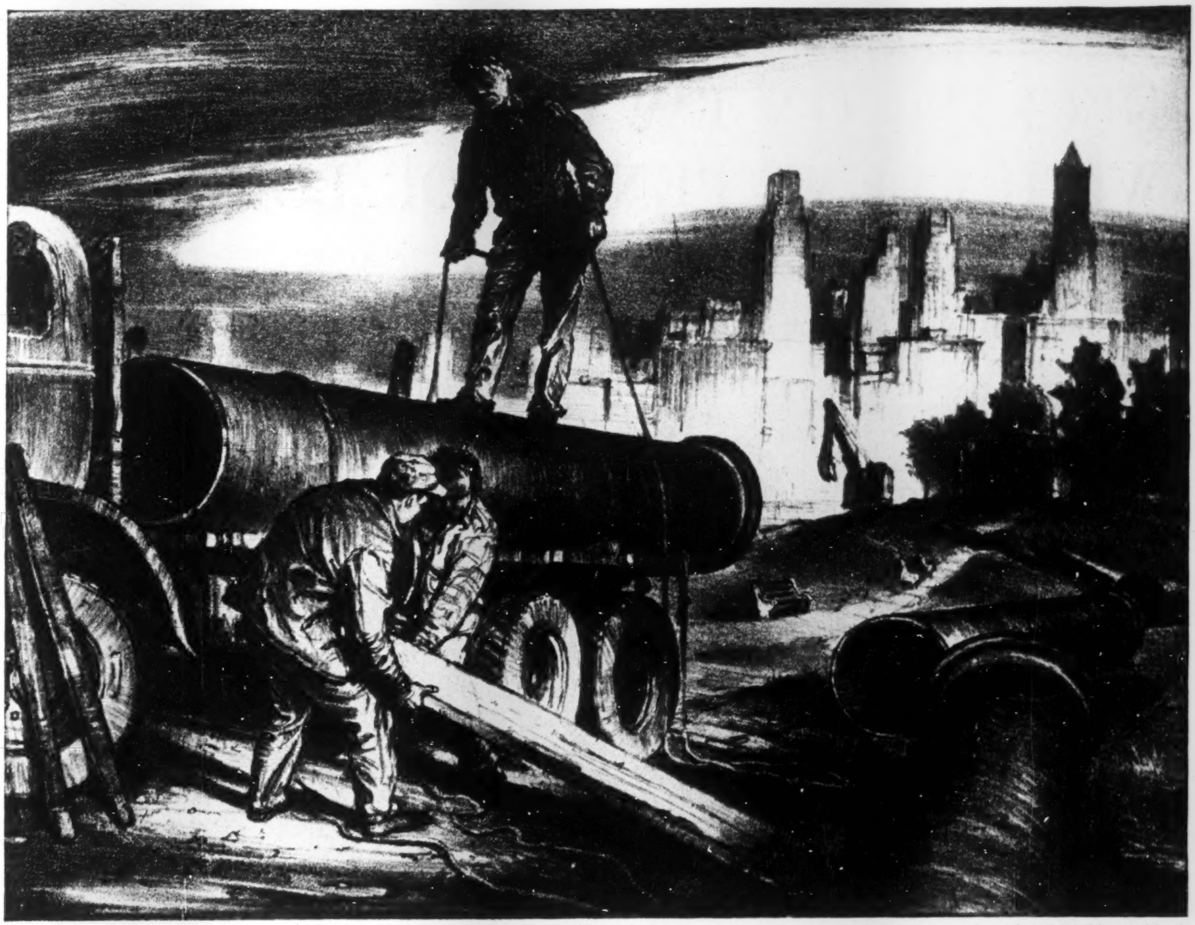

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CAST IRON PIPE being unloaded as shown above may be for use in the city's water, gas or sewerage system. The more-than-a-century service record of cast iron pipe in this country is a strong reminder that the installation of this pipe will be not only for the benefit of the present generation but for many more to follow.

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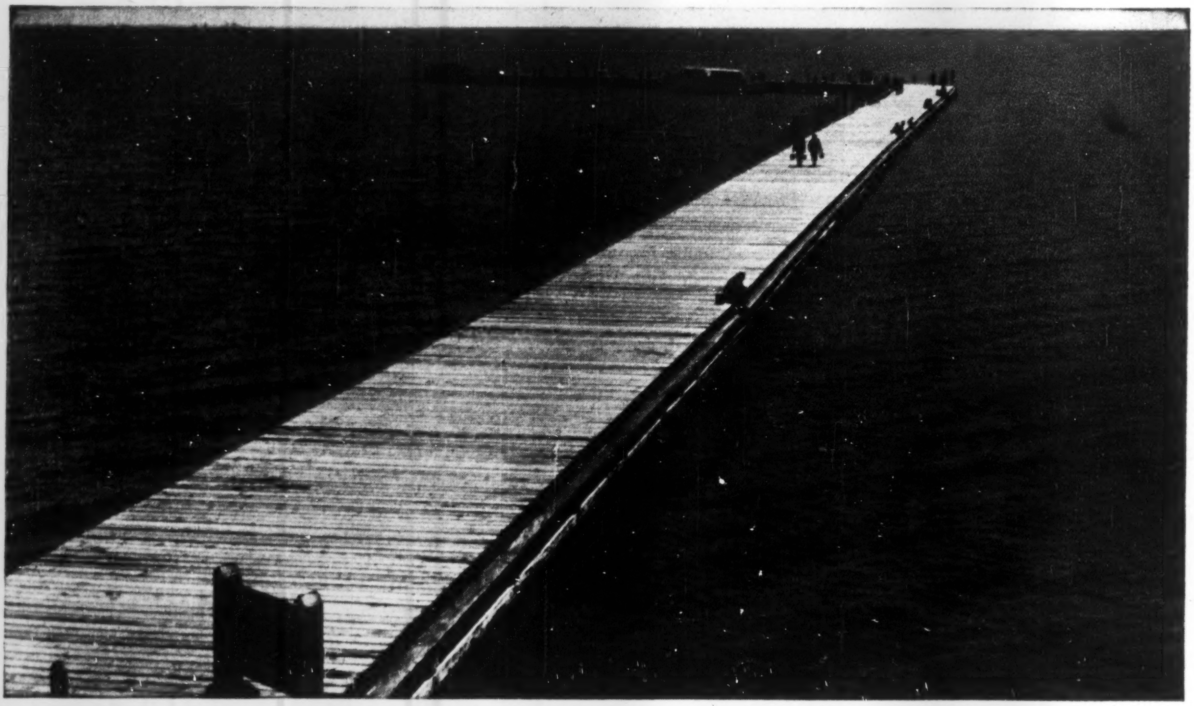

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THE CONSTRUCTION WEEK

- **Water transport?**—That scheme to move water from water-rich northern California to water-poor Southern California via the proposed $1.2-billion Feather River project got a boost out of the recent change in occupants of the governor's chair.

Gov. Goodwin J. Knight—who recently replaced Chief Justice Earl Warren as the state's chief executive—has proclaimed that the project is, to his mind, the state's "No. 1 job." The state legislature already has appropriated $1.5 million for engineering studies and has authorized the California Water Project Authority to issue revenue bonds to finance the development, if studies prove it feasible.

- **Legal note**—If you want a demonstration of the need to watch very closely what is before state legislatures, take a close look at a proposed law that squeaked through New York's legislature last session, but was vetoed (after loud protests by builders):

The law would have prohibited "operation or transportation of any crane, bulldozer, power tool, etc., erection of any building . . . within six feet of the location of any utility line."

Builders—with visions of being forced to travel cross-country or completely dismantle their equipment for transport, and endless legal trouble over almost any operation they conduct, caught up with the meaning of the bill almost too late.

- **Injury note**—Those accident and lost-time frequency rates compiled by U. S. statisticians look bad for construction—and undeniably aren't a feather in the cap of the industry and its safety effort. But the statistics should be taken with a few grains of salt.

The figures (for 1952) show: Injury frequency rate for all industry (in terms of millions of hours worked), 14.3; for construction alone, 34.6. Average days lost on account of injury: for manufacturing industry 85 days; for construction, 105 days.

But here's the salt: Construction workers, on the average don't lose time for injuries unless those injuries are really serious, the reason being that construction work is so highly paid in comparison with the average compensation payments, that workers would rather doctor their own minor injuries and stay on the job.

- **Policy note**—There's still plenty of controversy over the recent policy announcement of the Department of the Interior and Department of Defense regarding land acquisition in dam and reservoir projects—but it has already saved some money.

The policy provides for minimum outright purchases, and maximum reliance on obtaining use of land by means of easements.

Inaugurated at the Chief Joseph and Albeni Falls projects, the policy has brought (say Army Engineers) general approval from landowners, and considerably smaller costs.

U.S. ROYAL

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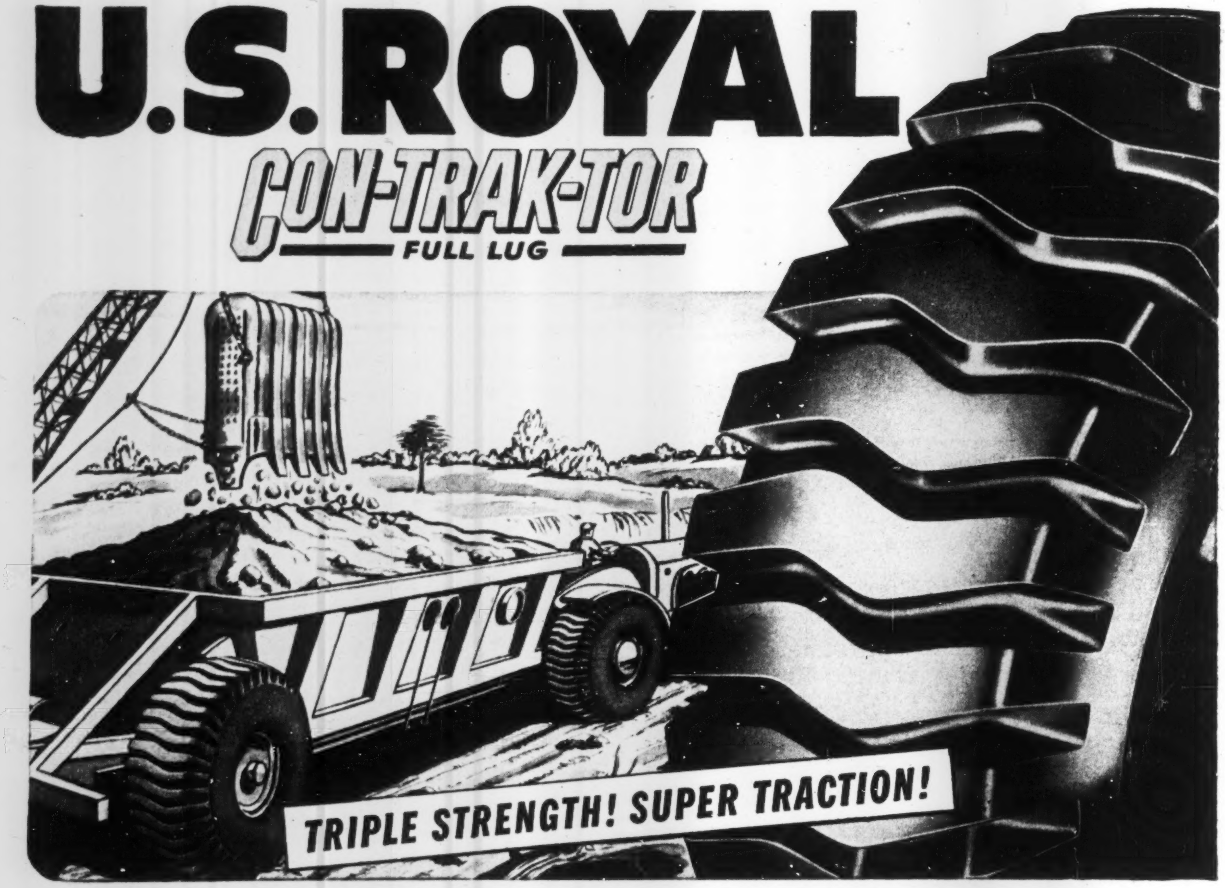
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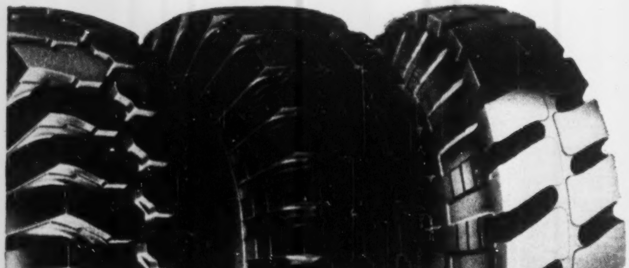

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WASHINGTON OBSERVER

Eisenhower is wrapping up a program for Congress that should be a boon to the construction industry. He is talking out his program on public works, housing, and power policy with congressional leaders this week, (see page 21).

•

Housing recommendations add up to another 1-million-start building program, wider aids for keeping the home-building industry booming.

Development of the upper Colorado River project will go to Congress for authorizing the start of $1.4 billion in construction.

More building of REA co-ops is getting a shove from changes made in Interior Dept.'s power marketing policies covering the Missouri River Basin.

All in all, an ambitious program and a change in direction for the Administration, now winding up its first year "shakedown."

•

Details on the housing recommendations came out Tuesday afternoon, the windup of Housing Administrator Albert Cole's advisory committee, which has been working since last summer. (See page 22).

The Upper Colorado River project went to the White House and the Budget Bureau in roughly these dimensions:

Construction of three dams (as against the five recommended late in 1952 by former Interior Secretary Chapman). They are Glen Canyon in Arizona ($431.3 million) Echo Park Dam on Green River in Utah ($176.4 million) and Navajo Dam on the San Juan in New Mexico ($63 million). The Split Mountain and Curecanti Dams were omitted, as well as the San Juan-Chama diversion project. Congress can give the nod for the start before the end of the next session.

The new power policy for the Missouri River Basin is a backdown for Secretary McKay. Before, he had intended to require REAs, public co-ops and private utilities to put in bids for power from the Missouri dams, and be held to their estimates under long-term contracts. Now REA and other "preference" customers will get a chance to get power on a priority basis as new dams such as Canyon Ferry, Fort Randall and Garrison come in. So, REA can plan more construction with assurance of a power supply to market.

•

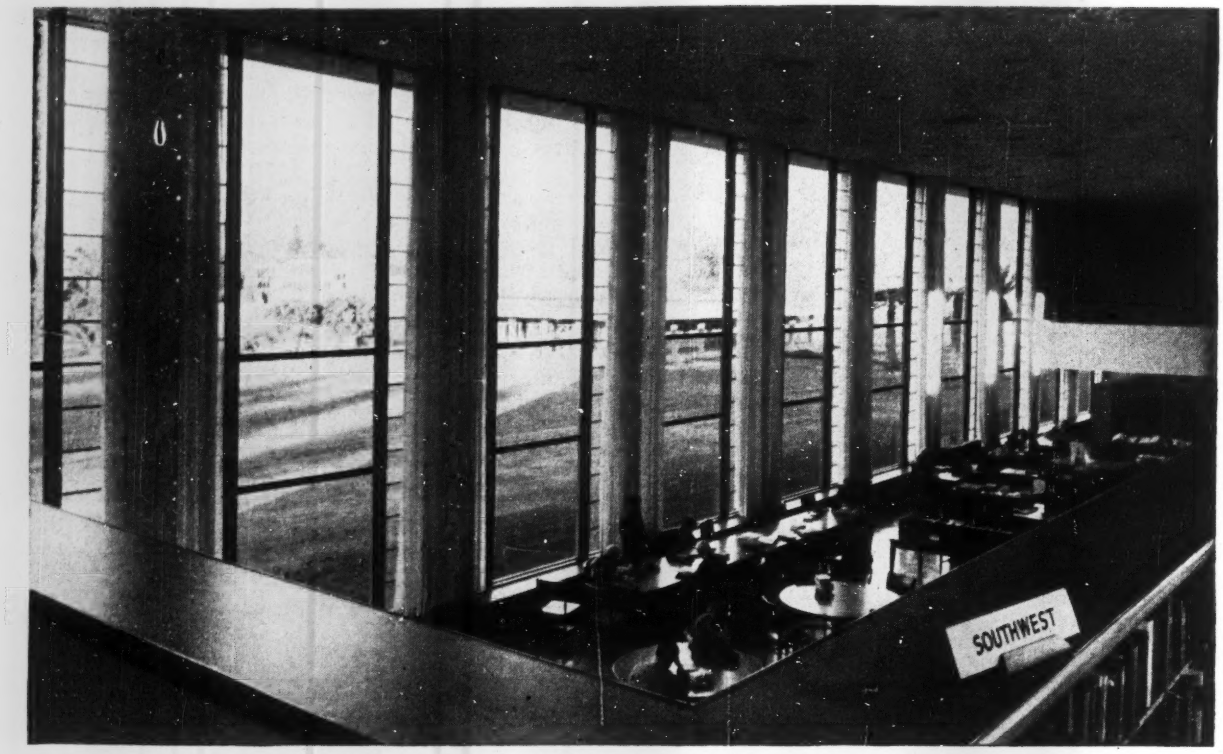
Joint operation of three Boise River, Idaho, reservoirs has been worked out between the Army Engineers and Reclamation. The three reservoirs will be managed as one system, with water storage, irrigation and power generation integrated. Only consent of water users in the 270,000 acres of irrigated land in the Boise Valley now is needed to put the joint management into effect.

•

Merger of the Engineers and Reclamation has been proposed again. A private government reorganization study by Temple University makes the recommendation along with others aimed at reducing the federal bureaucracy from 70 independent agencies to 30 or less. Also, the Bureau of Land Management would go from Interior to the Agriculture Dept., and the Veterans Administration would be shaken up completely. These ideas go into the Hoover Commission hopper for consideration next year. Ex-President Hoover will report at the end of 1954.

•

More air bases overseas may be in the offing. The Joint Chiefs of Staff, in a review of policy, are leaning more heavily on air power—upping the Air Force to 137 wings by 1957. Present overseas base construction programs are based on a 127-wing Air Force.



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DECEMBER 17, 1953

ENGINEERING NEWS-RECORD

Congress expected to ease up on tight construction policy

New session Jan. 3 will tackle several new Administration concepts of federal role in public works financing

Legislation affecting construction seems likely to get more sympathetic hearing in the second session of the 83rd Congress opening Jan. 3 than it did in the first session, which logically was dominated by the new Administration's anxiety to stress economy and force a re-appraisal of federal spending policies.

One sure thing is that the Administration will press for stronger federal credit suport for home building and rehabilitation than political prophets would have predicted a year ago. Housing will have a high priority in the Eisenhower legislative agenda.

Though proposed federal construction projects will continue to get hard-headed appraisal, the mounting importance of the '54 congressional elections will give politcal considerations greater weight than in the last session.

Here is a rundown of the major legislation due for consideration and the outlook for passage:

• Housing

Lining up so far as possible with the recommendations of the President's advisory committee on housing policies and programs (see story on next page), the Administration and its committee chairmen in Congress will set their legislative sights on federal credit supports that will sustain a housing volume of one million new homes per year.

In line with their objective, they are expected to propose the liberalizing and broadening of FHA mortgage insurance to ease the burden of monthly payments on purchasers of low-cost houses, to encourage repair and maintenance loans for the rehabilitation of old houses, and to stimulate the renovation and improvement of well-built older dwellings in declining sections.

As an aid to trade-ins of older houses, the legislators will act also to equalize FHA mortgage insurance for existing homes, putting those properties on the same basis as new houses. That would mean cutting the down-payment requirements on existing houses in the lower price brackets.

On public housing and slum clearance, the Administration will back continuation of the programs, with emphasis on broad improvement of the cities and eventual home ownership for the tenants in subsidized low-rent projects. After a battle—particularly on public housing—Congress probably will go along with both ideas.

• Highway aid

House and Senate leaders on highway legislation want to get together on ideas for next year's federal-aid bill early in January. As the bill will authorize funds for fiscal years 1956 and 1957, it will have no effect on federal outlays during the year that starts next July 1. That fact will be a minor influence in congressional decision on the size of the new federal-aid authorization.

More important will be the general conviction among the legislators that Congress must do something to improve the adequacy and safety of the nation's highways. There is a good chance that Congress will increase the level of federal highway aid from the present $575 million a year to a figure of about $750 million. (See page 27 for Chamber of Commerce discussions on the federal highway aid issue.)

• Military construction

Military construction requests for next year are in a state of flux—particularly as they apply to the Army, Navy and Marine Corps. Decision by Defense Secretary Charles E. Wilson to cut authorized strength of these services by 400,00 in the next 18 months has made it necessary to take a new look at facilities requirements.

A month ago there was reason to believe that the construction requests of the military would call for somewhat larger cash apropriations and project authorizations than Congress voted this year. Now, no such prediction is valid. The bills approved at the last session provided $240 million of new money and authorized new projects estimated to cost $490 million.

Until the services and the Defense Department work out new schedules of construction needs in line with the reduced manpower goal, final figures won't be available to Congress. But President Eisenhower may still be able to indicate a total for military construction in his budget message.

Actual spending on military public works in fiscal 1955 will hold to a high level, regardless of final decisions on new requests to Congress. Expenditures for the next fiscal year are expected to run within 20% of the $1.9 billion being spent this year. More probably, the level of spending will be only about 10% below the current year.

• Atomic energy

The joint committee will give serious consideration to modifying the Atomic Energy Act to permit industrial development of civilian atomic power. President Eisenhower's United Nations speech gave considerable impetus to the move to reap some peaceful dividends from atom development and there's better than an even chance for favorable action. (For further details, see page 67.)

• Lease-purchase agreements

The Senate Government Operations Committee has acted favorably on a bill that would enable the General Services Administration and the Post Office Dept. to enter into lease-purchase contracts with private constructors. This would be a sort of installment buying of public buildings with federal agencies taking title after 25 years of lease payments. The bill is on the Senate calendar, while a companion bill is before the Senate Public Works Committee.

• St. Lawrence Seaway

Legislation authorizing U. S. participation in construction of this controversial project is pending in the Senate and has White House endorsement. The House Public Works Committee held a week of hearings in June, but delayed action until the Senate vote was known.

At least eight resolutions authorizing U. S. participation were introduced in the House and the committee held hearings on the joint resolution introduced by Rep. George Dondero of Michigan, a strong supporter of the seaway. If the Senate approves the legislation, prospects are that the House committee will speedily O.K.

• Niagara power

Congress last year almost put through a bill turning over Niagara development to a group of five private power companies. The Senate Public Works Committee will reopen hearings early in the session.

In addition to the private power company bill and the New York State Power Authority Bill, there are two others. The Lehman-Roosevelt Bill would authorize the power development as a federal project. The Case Bill would clear the way for New York State to build the project. There is little chance of federal authorization of the project.

• Reclamation projects

There is a chance for modification of the "no new starts" attitude on reclamation projects that dominated action last year or at least, leaders claim, a need for a clarification of the policy.

Single biggest project is the billion-dollar upper Colorado water storage basin legislation which will get a two-week hearing before the House Interior Committee beginning Jan. 18. This will call for major multi-purpose dams and reservoirs at Echo Park, Glen Canyon, Flaming Gorge, Navajo, and Curecanti with a dozen plus reclamation projects tied in.

Already cleared by the House and awaiting Senate action is the $24-million Santa Margarita River joint dam and reservoir in the Falbrook Utility District. The $18-million authorization for the Santa Maria irrigation storage project, also in California, has been ordered reported by House Interior Committee and will go to the floor when Congress reconvenes. Before the Rules Committee of the House is another bill reported by the Interior Committee that would authorize the Foster Creek division distribution system in connection with the Chief Joseph Dam project. The bill calls for $4.6 million for first of ten divisions that would supply irrigation to the area below the dam site.

On the Senate site, the Frying Pan-Arkansas project in Colorado will be pushed. Hearings were held last summer before Congress adjourned.

One of most controversial bills that would produce a major change in reclamation philosophy is the measure sponsored by chairman A. B. Miller of the House Interior Committee that would provide for federal-state cooperation on project construction. Tagged the "local control bill," the measure would provide for an authorized state agency to petition for a project within that state, paying, a third of the cost, with the U. S. providing the rest.

• Bid-shopping

This bill, S. 848, prescribing a policy and procedure in connection with construction contracts made by executive agencies, was reported favorably by the Senate Judiciary Committee last session but was not brought up for Senate floor action because of lack of time. The bill carries over and can be brought up at any time leadership gives it a green light. The House Judiciary Committee reported a similar bill, HR 1825, on the last day of the session and it will be up for consideration by the House.

• Wunderlich Bill

S. 24, which would permit judicial review of decisions of government contracting officers, except in cases where fraud is alleged, is pending before a House Judiciary Subcommittee. The bill, with little opposition, was passed by the Senate last session and is conceded a good chance for favorable action by the House committee.

• Civil functions

Congress will take up at the coming session the first authorization bill since 1950 for new flood control and navigation projects. The public works committees of the two houses are expected to approve most of the projects reported favorably by the Corps of Engineers. Under consideration are $330 million of flood-control projects and more than $140 million of river and harbor work (ENR Oct. 8, p. 71).

Less clearcut is the outcome of action by the same committees on Department of Agriculture upstream flood-control programs. Twelve such programs have been submitted. They involve a total estimated cost of $460 million, of which $180 million is to be contributed by local interests.

Appropriations for Army civil functions are expected to exceed last year's total of about $340 million.

Housing report asks for end of Fanny Mae

President's study group recommends liberalizing and broadening FHA terms

Private housing will be easier to sell and public housing will continue on its present course until a better way is found, if Congress adopts the ideas proposed this week by President Eisenhower's advisory committee on housing policies and programs.

But the Federal National Mortgage Assn. (Fanny Mae), the government market that buys FHA and VA mortgages from original lenders, would be cut off without a penny. In Fanny Mae's place, the banker-dominated advisory committee recommends a privately owned but government-supervised National Mortgage Marketing Corp. Fanny Mae's $2-billion portfolio would be turned over to this corporation for orderly liquidation, and the corporation would become the national market to which lenders could turn when they want to convert FHA and VA holdings into cash.

Abolition of Fanny Mae is the most startling of the advisory committee's recommendations and one which home builders are expected to oppose vigorously.

The committee report points straight to another year of one million private housing starts and about 20,000 new public housing units, as its basic policy, the committee stated that every government housing action should facilitate operation of a strong, free, competitive economy. And it stretched that concept to include a wide range of liberalized and broadened FHA mortgage insurance for all classes of dwellings, new and old.

• More liberal credit terms—In the private housing market, the biggest effects would come from four committee proposals: (1) to soften FHA terms for one- to four-family houses and for rental housing projects, (2) to liberalize loans for home renovation or improvement and to encourage open-end mortgages for this purpose, (3) to grant special terms to builders and rehabilitators of housing for low-income families, and (4) to give old houses the benefit of the same down payments and amortization periods as would be granted for new houses.

On one-to-four-family houses, the advisory group recommends increasing the maximum FHA-insured loans to 95% of the first $8,000 of value and to 80% of the excess above $8,000.

ENR photo by Compton

ALBERT H. COLE, head of HHFA, served as housing advisory unit chairman.

At present the ratio is 95% of the first $7,000 and 70% of the excess.

Also, the committee proposes increasing the maximum FHA loan on houses in this category by 25 to 40%. These increases would raise permissible mortgage loans to $20,000 for a one- or two-family house, $27,500 for a three-family, and $35,000 for a four.

For all these loans, the maximum mortgage amortization period would be made uniformly 30 years. The present term is 25 years for houses costing more than $7,000.

Worth noting is the fact that the committee would make these liberalized mortgage terms applicable to existing homes as well as to new houses. Older houses today are under a handicap: The Maximum FHA loan is restricted to 80% of value.

On rental housing, too, the committee would increase allowable loans. The report recommends removing the limit of $10,000 per unit and applying $2,000 per room or 80% of value, whichever is less. For fire-resistant elevator buildings, the limit would be higher—$2,400 per unit. For projects averaging less than four rooms per unit, the present $7,200 maximum should be retained.

Modernization and repair loans would be upped from the present maximums of $2,500 for three years to $3,000 for five years. And alteration and conversion loans would retain the maximum $10,000 limit but would increase the present seven-year term to 10 years. On larger properties, the loan maximums could be made $1,500 per unit, if that allowed a bigger loan.

And FHA mortgages should include an open-end clause—wherever state laws permit—to allow borrowing under the original mortgage for repairs, improvements and additions.

- **Public housing experiment**—As a substitute for public low-rent housing, the advisory committee proposed a two-year experiment with special loan insurance incentives for builders and owners. To meet the needs of low-income families the agency could insure no-down-payment 40-year loans to owner-occupants up to $7,600—or $8,600 in high-cost areas.

Further, to builders and owners of rental housing—either new or rehabilitated—for such families, FHA would insure loans for 85% of property value, provided the renting was done under lease-purchase agreements enabling the tenant to buy when family income improves with the help of a 40-year, 100% FHA mortgage.

The committee would continue the low-rent subsidized housing program.

But the committee did propose some new requirements for public housing projects. One was that they should pay at least 10% of shelter rent to the local government in lieu of taxes. Another proposed that the projects—after they are amortized—pay back the federal and local contributions out of net revenues.

The report stressed conservation and renewal of urban areas worth saving. It recommended setting up an urban renewal administration in HHFA to handle slum clearance. The committee recommended technical and professional service to communities, plus the setting aside of one-third of the slum-clearance grant funds to go to cities doing most in the overall attack on decay.

Florida governor fires road board, charging five counts of malfeasance

Florida's Acting Gov. Charles E. Johns has fired the five-member State Road Board, appointed by the late Gov. Dan McCarty, on charges of malfeasance in office.

This makes the third set of appointed officials Johns has ousted within recent weeks—after they refused to resign. A month ago he suspended the five-member Florida Turnpike Authority for repeating toll road surveys (ENR Nov. 18, 1953, p. 24). Before that, he dismissed the State Racing Commission.

Some time this week the acting governor is expected to name five new men to the road board.

Five specific accusations were made by Johns against the board members:

- Failing to plan, inaugurate and put into effect a suitable road and bridge building program.
- Dereliction in the maintenance of roads and bridges.
- Purchasing excessive amounts of printing from a single concern without competitive bids.
- Eliminating emulsified asphalt as a competitor with cut-back asphalt.
- Manipulating purchases so that most of the road department's gasoline was bought from a Tallahassee agency.
- Buying grass seed at excessive prices from a broker who got the seed from a nursery owned by Road Board Chairman Richard Simpson and his family.

Members of the board—beside Simpson—were Thomas B. Manuel of Fort Lauderdale; Grier Kirkpatrick, Gainesville; W. Howard Frankland, Tampa, and J. Saxton Loyd, Daytona Beach.

Simpson, Manuel and Saxton issued public statements branding the charges as "trumped-up, false, ridiculous and petty politics."

The suspensions will stand until the next session of the Florida legislature in April, 1955. They must then go before the Senate. If the Senate upholds the malfeasance charges, that ends the matter. If it refuses to uphold them, all of the suspended officials will be entitled to reinstatement in their jobs with back pay.

State law not applicable to T-H law

A landmark decision having far reaching repercussions on labor law legislation on both state and federal levels came from the U.S. Supreme Court last week. It unanimously ruled that an employer cannot sue a union under state law for unfair labor practices if the issues are covered by the terms of the Taft-Hartley Act.

Justice Robert H. Jackson wrote the court's 9-0 opinion in a case appealed by the Central Storage & Transfer Co., Harrisburg, Pa., from a recent ruling by the Pennsylvania State Supreme Court. The decision, in effect, holds that the company erred in going to state court, rather than the National Labor Relations Board for relief.

The Supreme Court has not yet acted on a similar construction labor case. It involves the AFL Building Trades Council and the Kinard Construction Co., Russellville, Ala., (ENR Oct. 1, p. 24). Conceivably, the court could decide the Kinard case the same way after recess, Jan. 4.

Cement deficiency on highway project in Minnesota stirs bitter controversy

Probing by road engineers also results in charges that state was short-changed on steel tie-bars

Disclosure of a deficiency of 3,919 barrels of cement in the new concrete on a portion of a nine-mile stretch of highway in Minnesota has resulted in state highway engineers investigating other reported deficiencies.

The nine-mile paving project on State Trunk Highway 7 between Taylors Falls and Center City, Minn., was completed in August by the Okes Construction Co. of St. Paul on a $670,110-contract.

Along with investigating the cement deficiency charge, state authorities also are confronted with a claim that the contractor failed to meet requirements on steel tie-bars which are imbedded across the center line. George E. Russell, state highway department project engineer who supervised the job, made this charge after checking on tie-bar installations by Army mine detectors.

The tie-bar specifications called for spacing of 2½ ft. Russell said that 21,754 bars should have been used and that invoices for 22,057 had been found. But, according to his findings, only 18,815 were installed.

• **Another cement charge**—Meantime, a cement deficiency on another Okes job—Highway 14 between Tyler and Lake Benton was reported by M. B. Haase, the state engineer on that project. Test cores of concrete poured there are now being checked.

Disclosure of a cement deficiency on the Taylors Falls project was made by Russell in September and the matter was referred to Richard Golling, state public examiner. On Dec. 2, Golling issued his report, stating that "carelessness and inexperience" on the part of both state employes and Okes workers were responsible for the deficiency. Golling placed the value of the 3,919 barrels of cement at $14,000.

State Attorney General J. A. A. Burnquist, who entered the probe following the Golling report to State Highway Commissioner Michael J. Hoffmann, said that about $400,000 of the contract price is still due the Okes firm and that it was being held up pending determination of the state's claim.

• **Examiner's report** — According to Golling, the cement deficiency "undoubtedly revolves around operation of the scales" at the mixing plant. The section under scrutiny was placed between July 23 and Aug. 28. Russell is reported to have noticed the cement deficiency first when samples of concrete from this portion of the job broke before they should have in pressure tests made on Aug. 17 and 24.

The scales were operated by Okes employes, but inspectors from the State Department of Weights and Measures checked them and kept the mixing operations under scrutiny.

Although the scales appeared accurate, Golling said in his report, carelessness in not making certain the weigh batcher was empty after each dumping into the truck could account for a shortage. Signal lights on the batcher for indicating load accuracy didn't always work, Golling said he was told by employes.

"The construction company could easily have determined long before completion of the job whether the quantity of cement supplied was less than the quantity fixed by the state for its batch designs," the public examiner's report read.

Sidney R. Okes, partner in the contracting firm, laid the blame for the deficiency on state highway employes, charging them with "improper checking, balancing and setting of scales." He said his company put in all the cement for which the scales were set by highway department engineers and inspectors.

State highway officials countered Okes' charges by pointing out that the firm "entered into a contract to provide a certain type of road—they can't get around that" and . . . "even without supervision they would be obliged to do the work according to the contract."

Survey report urges U.S. Weather Bureau drop tailored forecast for industry

Engineers and contractors soon may have to look entirely to private weather specialists for specific long-range forecasts geared to their particular problems if recommendations by a Dept. of Commerce advisory committee on weather services are implemented.

The committee, appointed by Commerce Secretary Sinclair Weeks to look into the sprawling activities of the Weather Bureau delivered a 59-page report to the Commerce Department last week after five months of investigation. The group of eight non-government meteorologists was headed by Joseph J. George, top meteorologist for Eastern Air Lines.

The basic premise of the report was that the Weather Bureau, up to now, has done better than could be expected with the funds and facilities available to it. But, in addition to increased appropriations and decentralization of its activities, the bureau should turn over to private meteorological companies the job of special weather predictions geared to industry. (For what such private companies have to offer see ENR July 16, p. 35.)

The committee said that up to now, the bureau has been called upon to write specific long- and short-range forecasts for industry to aid in plant site location, hydroelectric activities, off-shore oil well drilling, gas transmission and many other activities. As a result, forecasters and observers have been doing jobs for industry that have proved costly in money and manpower to the bureau, the report declared. These jobs belong in the province of private or consulting meteorologists, it added.

Climatology activities—the activities of the bureau dealing in large-scale land utilization, water supplies, and climatic changes—should be stepped up, the committee advised.

The George committee also recommended that the Department of Commerce make a better attempt at supporting the budget program of the Weather Bureau. The committee said that the Secretary of Commerce should support such projects as a national radar storm detection network, furnishing more facsimile equipment—map making—to field stations, modernization of facilities, research in tornado and severe storm causes, and use of electronic computers in forecasts.

The USWB data used by ENR in its monthly weather page is not affected by present recommendations.

To study cloud-seeding

An eleven-man board to investigate weather modification (cloud-seeding to produce or prevent rain) was rounded out last week with appointment by President Eisenhower of five civilian members. Six government representatives also will act on this Weather Evaluation Board, authorized by Congress last year.

Immediate problem before the board is to determine if benefits outweigh possible harmful effects of cloud-seeding.

Slab is anchored to wall of canyon

A huge rock slab—180 x 120 x 19 ft—is being anchored to the canyon wall above the Nevada valve house at Hoover (Boulder) Dam.

There was no immediate danger that the slab might drop off, no movement having been noted in the 17 years since the dam was completed. Government engineers simply decided to have it anchored at this time as a precautionary measure. The Selby Drilling Corp. of Sanger, Calif., is doing the job under a $111,909 contract.

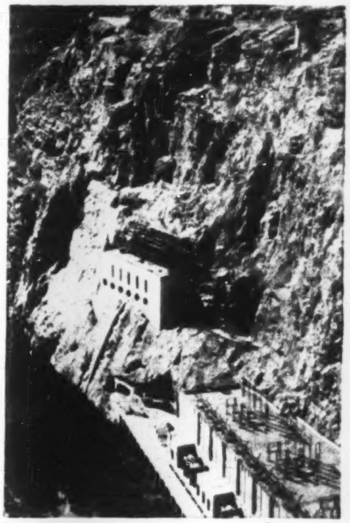
To anchor the slab to the wall, some 349 holes for 2-in. anchor bars are being drilled through the rock slab and valve house wall into the rock abutment. Bars have 3-in.-long sleeves welded to their ends for improved anchorage. The depth of each hole varies according to the thickness of the slab, but must be at least 13 ft from the seam into the abutment. Holes have a 3½-in. dia.

Before placing the anchor bars in the holes, the portion of the bar which lies between the rock seam and rock surface is wrapped with paper to prevent bonding of the grout to the bar. One-third of the hole is filled with grout and the anchor bar forced into the hole. The remainder of the grout required to fill the hole is introduced through a supply line fastened to the bar.

At least 28 days after grouting the bars are loaded to a tension of 63,000 lb and the nut on each bar is tightened against the bearing plate using a torque of 2,000-in.-lb. Some of the bars are checked by use of strain gages mounted on the bars after loading to make certain there is no relaxation of the required stress after releasing the torque.

Along with anchoring the slab, the contractor is filling the seam with cement grout. To do this, grout holes are drilled through the rock slab to intercept the seam between the rock slab and the abutment rock. The grout holes are drilled after the placing and loading of the anchor bars. Drainage holes will be drilled later.

The work is being done under the direction of L. R. Douglass, Bureau of Reclamation director of power for the Boulder Canyon project. Heading the Bureau of Reclamation staff supervising the job is Reupert Spearman, chief of the Civil Engineering Division.



LOOKING DOWN and downstream from top of Hoover (Boulder) Dam at the Nevada valve house and rock slab.

PORTION OF ANCHOR BAR which lies between rock seam and rock surface is wrapped with paper to prevent bonding of the grout to the bar.

Photos by Cliff Segerblom

JACK IS PUMPED to stress anchor bar to 63,000 lb. Anchor bars are loaded in groups of 10, with loads applied to all simultaneously.

Way cleared for link between big turnpikes

A legal obstacle to start of construction on a direct link between the Pennsylvania and New Jersey turnpikes has just been removed. Officials of Burlington County, N. J., which now owns the Burlington-Bristol toll bridge over the Delaware River, have consented to construction of a new span on a link between the two turnpikes about four miles north of their bridge.

Consent of the owners of the Burlington-Bristol Bridge was necessary because the charter under which that bridge was built authorized the owners to enter into a covenant with bond holders that they would not consent to construction of another bridge within ten miles of that structure while any bonds were outstanding.

That bridge was built by a private company but was bought by the county in 1948. Details of the arrangements made with the county have not been announced.

The Pennsylvania Turnpike Commission now is building an extension to within about two miles of the Delaware River at the site of the proposed new bridge, and designs for the bridge are being made. The New Jersey Turnpike Authority will have to build about six miles of highway on its side. It is expected that work now will be pushed on the link as it will be badly needed as soon as the Delaware Extension of the Pennsylvania Turnpike is completed. The old Burlington-Bristol Bridge and the connecting highways will be entirely inadequate to handle traffic that then will seek to reach the New Jersey Turnpike.

Electronic brain to aid flood-control operations

Army Engineers have let a contract for development of an electronic brain for use in making the voluminous and complex computations required for management of the vast system of reservoirs in the Missouri Basin.

The Raytheon Corp. and New York University will develop a design for the computer and their recommendations will be tested on the electronic computers at the Army Map Service before the machine is built.

Explaining the need for the device, Brig. Gen. W. E. Potter, Missouri River Division Engineer at Omaha, noted that eventually there will be more than 100 reservoirs in the basin. With many of them having flood-control functions, he said that extreme accuracy and speed in making decisions as to the magnitude and sequence of water releases is necessary for best results.

Utility interests signify willingness for partnership with federal agencies

One local district and six power companies are ready to begin surveying prospective hydro project sites

Significant first steps toward implementing the Eisenhower Administration's partnership concept of water resources development were taken in the Pacific Northwest last week.

- With the Bonneville Power Administration agreed on marketing surplus power from the project, the Chelan County, Wash., Public Utilities District applied to the Federal Power Commission for permission to survey the proposed Rocky Reach Dam site on the Columbia River near Wenatchee, Wash. Congressman Walt Horan, the district's representative in Congress, proposed federal legislation which would authorize the Army Engineers to build the 585,000-kw project.
- Six Pacific Northwest power companies made known their willingness to enter into a partnership with the federal government in construction of hydroelectric projects. Their decision was revealed at a power conference in Seattle, called by the governors of Washington, Oregon, Idaho and Montana.

• **Rocky Reach proposition**—The Rocky Reach plan calls for a 1,192-ft-long spillway, an intake and powerhouse section 1,390 ft long and an earth fill section creating a reservoir 41 mi long. Fish ladders and shipping locks would be included.

Horan's proposed legislation would authorize the project, appropriate planning funds, permit the Corps of Engineers to build the dam and provide for marketing by the Bonneville Power Administration of power not required locally. The PUD would repay the corps for its work, receiving credit for non-power features which would be paid for by funds from the federal government.

Paul Raver, BPA Administrator, told a Wenatchee luncheon group he had been instructed by Secretary of the Interior Douglas McKay to assist the Chelan PUD in "finding a workable procedure for partnership development of the Rocky Reach Dam site." Such a procedure also would make possible construction of the 1,200,000-kw hydroelectric project of the Grant County PUD on the Columbia River at Priest Rapids, he said.

Still to be spelled out is what the federal government's proposed partnership will amount to in practical terms. In the construction of McNary Dam, 95% of the cost is allocated to power. If the federal government's participation in future dam projects should be limited to 5%, the partnership wouldn't mean much, public power leaders believe.

• **Power company plans**—In disclosing the decision of six Northwest utility firms to seek a partnership with the federal government, J. E. Corette, president of Montana Power Co., said they have been studying prospective power sites for the past three months. They expect to file an application with the Federal Power Commission this month to carry out preliminary investigations on one or more sites on the Columbia River or its tributaries.

Power companies involved, in addition to Montana Power, are Idaho Power Co., Mountain States Power, Washington Water Power, Pacific Power & Light and Portland General Electric. A seventh, the Puget Sound Power & Light Co., will be invited to participate.

Some of the projects under investigation are "very large" and would provide more power than any single company could use, said Corette. If the federal government would bear such incidental costs as could be charged off to flood control, navigation, recreation, etc., the companies could finance the power phase of a project. Ralph A. Tudor, Undersecretary of the Interior, has indicated such a division of costs might be possible.

The Seattle conference, attended by public and private power producers and distributors in the area, resulted in formation of a policy committee.

Federal and private hydro projects—both proposed and under construction—which would add more than 10,000,000 kw to the Northwest power pool were discussed at the meeting. It was noted that projects now programmed for construction will provide the area with sufficient power for the next five or six years, if present schedules are kept.

No interior supports in 1½-acre building

R. G. LeTourneau, Inc., has constructed at its Longview, Tex., plant a hemispherical aluminum building 300 ft in diameter with no interior supports. The structure was erected by the "umbrella" principle—exterior covering and reinforcing ribs were suspended from a central mast, which was removed when the dome was completed.

A similar method was used last spring for the 93-ft dome over the inner court of the Ford Rotunda, in Dearborn, Mich. There, however, the covering was supported on three-dimensional trusses (ENR May 28, p. 31).

Construction of the LeTourneau building started with the erection of the central mast. A circular collar, which could be raised or lowered by an electric cable hoist, was placed on the mast and temporarily set at a height convenient for construction to proceed at ground level. Then, a horizontal circle of 7x12-ft aluminum sheets, ⅛ in. thick, was bolted to the collar and to a second aluminum ring.

When this step was completed, the collar was raised and another concentric circle of plates bolted on. The cycle was continued until the dome was completed, a light aluminum rib stiffening the horizontal joints. Finally, the dome was lowered onto prepared foundations and the mast removed.

The structure has a surface of 97,000 sq ft, encloses a floor area of 70,000 sq ft, reaches a height of 85 ft and weighs 160 tons.

Virginia to consider new trucking laws

The Virginia state highway department has engaged the Chicago firm of Griffenhagen Associates to determine the revenue potential of a new weight-distance tax on trucks that has been recommended by a legislative study committee.

The new levy, which would replace the state's present 2% gross receipts tax that applies to most of the trucking industry, was one of a number of proposed changes in trucking regulations. These recommendations plus the consultants' report on tax revenue will be considered by the 1954 General Assembly.

Among the other recommendations are: 1. Increase the maximum weight limit from 50,000 to 56,800 lbs.; 2. Raise the maximum length of the heaviest class of trucks from 45 ft, exclusive of coupling to 50 ft, including coupling; 3. Retain present limit of 18,000 lbs for axles, but reduce limit on tandem axles from 36,000 to 32,000 lbs.; 4. Abolish, except on license tags, the reciprocity agreements which Virginia has with other states; 5. Increase the tax on diesel fuel two cents above the gas levy.

Federal highway aid issue debated

Chamber of Commerce conference on highway financing also explores advantages and pitfalls of toll roads

The controversial proposal that the federal government withdraw from the field of motor fuel taxation was explored from many angles by highway experts attending a conference sponsored by the U. S. Chamber of Commerce in Washington last week.

Although the conference was called to deal with the broader subject of highway finance, most discussion centered on the federal-aid issue, especially the income from the two-cent federal gas tax.

Discussion of federal aid was sparked by Gov. Walter J. Kohler of Wisconsin, who championed the proposal of the recent Conference of Governors that the federal government withdraw from motor fuel taxation, leaving that field open to the states. Little outright support for his stand developed in the panel discussion that followed. Most speakers expressed the view that the step should be taken gradually, if at all. Some feared that prompt action by Congress on the governors' proposal would result in much confusion. All were concerned lest such action might mean the end of the Bureau of Public Roads.

• **Would retain tax**—Most outspoken advocate of retention of the federal gas tax was Rep. J. Harry McGregor, chairman of the House Subcommittee on Roads. He said he could see some logical reasons for repeal of the federal tax but more cogent arguments against it. Chief of those, he added, is that "automatically it would do away with the Bureau of Public Roads" with all its coordinating activities.

McGregor said that these would be no assurance that the states would add the equivalent of the federal tax to their levies. And, if they didn't, he added, the road building program would be reduced sharply at a time when expansion is most needed.

• **AASHO stand changed**—A. E. Johnson, chief engineer of the Arkansas Highway Commission and president of the American Assn. of State Highway Officials, said that the AASHO at one time had advocated giving the states exclusive right to tax motor fuels, but that when Congress turned down its proposal it had abandoned that plan. Instead, the AASHO now favors increasing the federal aid to an amount not less than the federal gas-tax income.

Specifically, AASHO now proposes that federal aid be increased from the current $575 million to $900 million. Mr. Johnson also advocated a comprehensive study of all highway financing to determine what the proportionate share of each class of highway user should be.

• **Estimates of highway needs**—Figures to indicate how far road building is lagging behind highway needs were given at the opening session by James Cope, vice-president of the Chrysler Corp; G. Albert Hill, head of the Connecticut Highway Department; and Richard M. Zettel, economist of the Institute of Transportation and Traffic Engineering at the University of California.

Commissioner Hill said that the current AASHO restudy of federal-aid highway system needs is expected to put the cost at $34 billion. That system includes 670,000 mi. In addition, there are 190,000 mi of state highways and 2,390,000 mi of rural and town roads for which there is no up-to-date estimate of needs. The closest estimate, Hill said, is in the 1950 Congressional Economic Report, which put the figure at $12 billion. That would bring the total for all roads close to $50 billion.

• **Toll road possibilities**—In the opinion of Paul L. Troast, chairman of the New Jersey Turnpike Authority, toll roads will play an increasingly important role in the future highway development, judging by current plans.

But Mr. Troast immediately qualified that statement by saying that "toll roads are not the panacea for the nation's highway ills." Their greatest advantage lies in the fact that toll financing makes it possible to build a badly needed main trunk highway quickly, whereas the same road could be built only piecemeal over a period of several years under normal financing methods, he pointed out.

Added advantages of toll roads, Troast said, are found in the relief afforded to congestion on parallel free roads and the release of normal highway funds for other work.

• **More miles in prospect**—Equally optimistic as to the future of toll highways was Charles L. Dearing, Deputy Undersecretary of Commerce for Transportation, who was co-author of the Brookings Institution report on toll roads a few years ago. Dearing said: "It is entirely possible that within ten years approximately one-third of the total rural mileage of the designated Interstate System can be improved to acceptable standards through the use of wholly self-liquadating toll projects. (The Interstate System, urban and rural, has a total length of about 40,000 miles.)

• **Dangers in state support**—Dearing urged, however, that the financing of toll roads be kept on a self-liquidating basis, done exclusively through sale of revenue bonds to private investors. The use of the "full faith and credit of government for this purpose invites the substitution of political criteria for sound engineering, traffic programming and economic tests in determining when and where a toll facility should be built," he declared.

The advisibility of putting state credit back of toll-road bonds was questioned from another angle by C. C. Hardwick, partner of the financial house of Smith, Barney & Co., New York. After observing that state credit had been put back of the bonds of the New York State Thruway and the Garden State Parkway in New Jersey, Hardwick said that "anything approaching general use of this method may entail grave risks to state credits."

$107 million road program for Washington?

A $107-million highway improvement program in the suburban Washington area of Virginia has been recommended in an engineering report to the Virginia General Assembly by Wilbur Smith & Associates of New Haven, Conn.

The program would include: $67 million in new highway construction, $19 million for improving the existing road system in the area and two additional bridges across the Potomac River at a cost of $21 million.

The report proposed a special federal grant, especially for the Potomac River bridges and the expressways among the new projects recommended. It added that no substantial portion of the requirements can be met from Virginia highway funds. Traffic created by federal activities was held responsible for the problem.

Contractors will keep plugging for overhaul of jobless pay law

Undaunted by their failure to amend the state's unemployment compensation laws at this year's legislative session—and alarmed at what they say are ever-mounting costs—New York State construction contractors are planning new action to effect changes in the state's laws.

Members of the state's Building Industry Employers' Assn., holding their annual meeting at Albany, devoted a good portion of their sessions to discussions of the hardship that they say the laws' application works to the construction industry, and approved resolutions calling for continuation of their fight to amend the statutes.

As the state's unemployment benefits law now reads, a worker who is fired or laid off a job is entitled to benefits of a maximum of $32 a week for a maximum of 26 weeks in any calendar year. The payments are made out of funds collected by the state from both employer and employee. The employee must have been continuously employed in "covered" work for a period of 20 weeks prior to the layoff.

• **Triple play**—But, say contractors, this works a peculiar hardship on construction where workers often work for several employers over a period of 20 weeks.

A bricklayer may work for contractor A for a period of six week—then see that his job is ending, and quit to go to work for Contractor B. He may work for B for several weeks, then quit again to work for Contractor C. at C's job, the bricklayer may get into an argument with his foreman, and be fired.

Up to this time, the bricklayer has not been entitled to unemployment benefits, since he voluntary quit both A and B. But now he's been laid off involuntarily—and entitled to payments.

New York State agencies have been solving this problem by assessing all three employers—proportionately to the time they employed the man. Thus, say the contractors, they are in the position of suddenly being assessed for payments to a man who has comparatively long since left their employ—and thus of having their funds tied up for long periods of time against such an eventuality.

Lending point to the contractors' concern were figures presented to the meeting that made it clear that most of the state's 23,000-odd construction firms employ very few men on anything approaching a steady basis. Although there are more than 300,000 construction workers in the state—more than 13,000 construction firms employ three or less men on regular payrolls; 4,000 firms have less than eight employees; only 20 employed 500 or more men.

• **Try again**—Attempts of the contractor group and other groups to amend the existing law failed to go through the legislature this year—partially, BIE members think, because of lack of general understanding of the hardships worked in an industry such as construction.

But, faced with a move in the legislature and from the state's department of labor for an increase in unemployment benefit payments, the group vowed to continue its battle for a change.

• Antitrust liability

Even though general employer-union agreements are specifically exempt from antitrust action under some state laws (as New York's Donnelly Act) they are still subject to federal action under some conditions.

Those conditions—New York state contractors were told last week—would revolve around agreements that would have the effect of excluding or limiting products or processes.

Case in point was the U.S. Supreme Court's recent decision holding that electrical contractors and a local of the International Brotherhood of Electrical Workers were in violation of the antitrust laws, in connection with an agreement (on wages and working conditions) that included a virtual prohibition on certain electrical products. The U.S. high court had the final say after nearly 13 years of litigation over the matter.

Attorneys for the contractor group pointed out that state laws specifically permit area agreements between unions and employer groups relative to wages, hours and working conditions. "But any provision that will have the effect of limiting uses of products or processes will make both sides subject to federal antitrust prosecution," the builders were told.

ENR staff photo

WILLIAM SANDERS—"When I quit this fight will be when they carry me out."

Showdown fight

Ironworkers international cracks down on Local 595

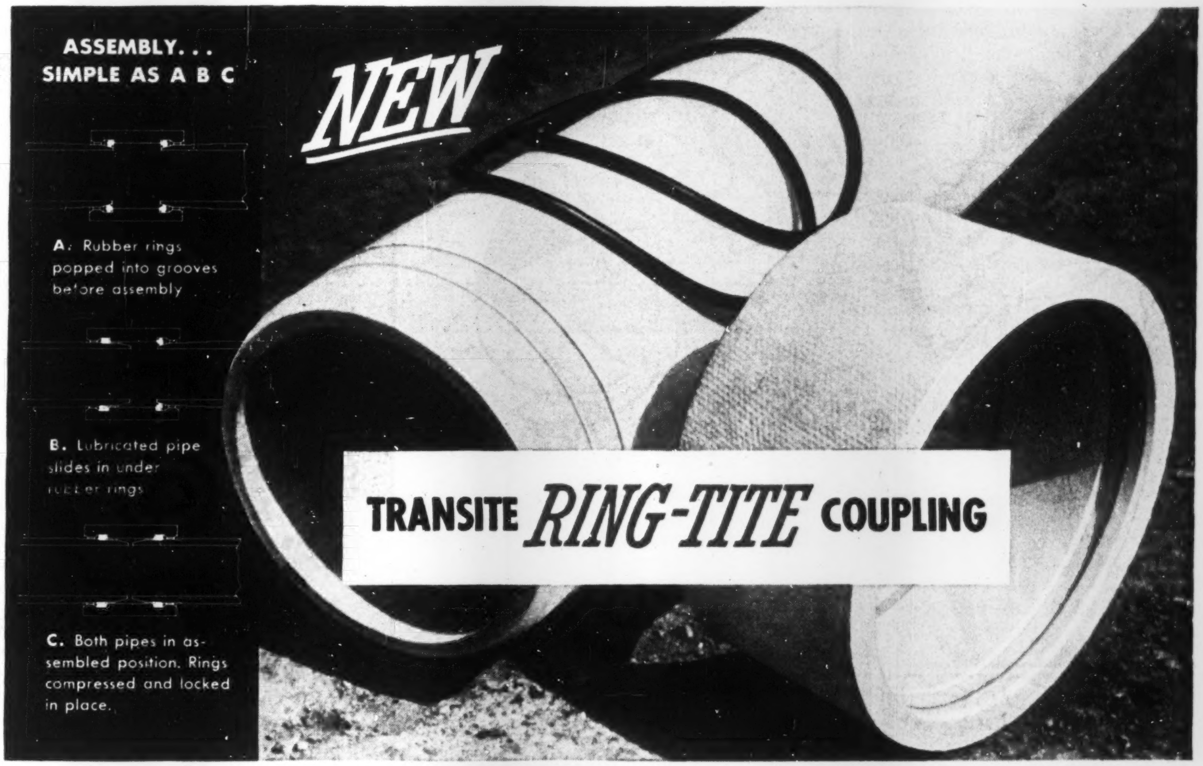
For several months a local vs. international showdown has been shaping up at Paducah, Ky., over who is going to control Local 595 of the International Assn. of Ironworkers. William Sanders, business agent and secretary-treasurer of the local, has resisted all moves of the international union's leadership as a threat to local autonomy. And the international—following the pattern of other construction unions in guiding the affairs of locals supplying workers to the Paducah atomic energy plant and its satellite steam power plants—has become increasingly irked at Sanders.

So, last week, the international leaders and Sanders committed themselves to a fight to the finish. John Lyons, international president of the ironworkers, announced that Sanders had been expelled for life from the union and that other officers of the local had been suspended from union activities for periods from seven to ten years.

The action followed secret hearings last fall on charges that Sanders had defied an order by Lyons to end an informal blockade by ironworkers which closed the Joppa plant for a month.

Within hours Sanders had obtained a court order restraining the international from replacing him, the first step, he said, in a move by the Paducah local to drag the case into open court.

Lyons could not be reached for comment, and Harold Stern, counsel for the international, refused to discuss the case with an ENR representative.



A. Rubber rings popped into grooves before assembly

B. Lubricated pipe slides in under rubber rings

C. Both pipes in assembled position. Rings compressed and locked in place.

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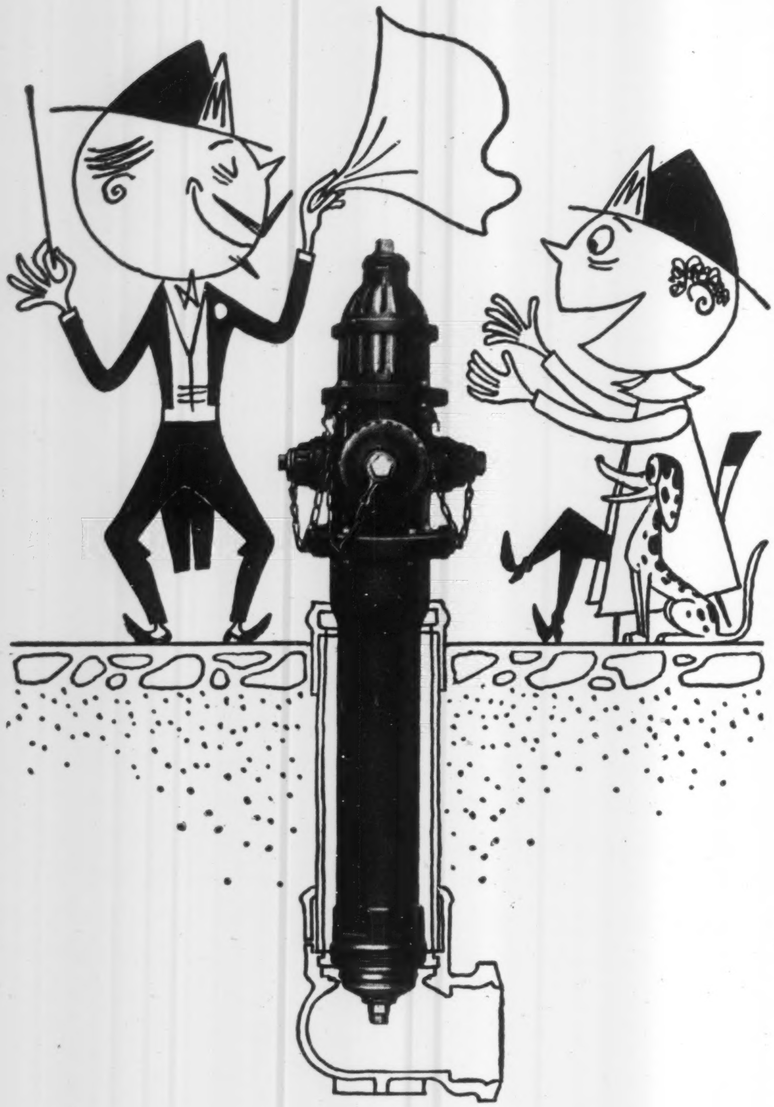

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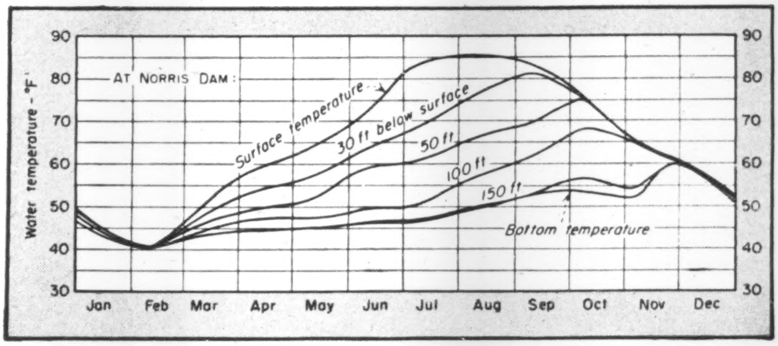


STRATIFICATION ACCORDING TO TEMPERATURE of water in reservoir takes place during warmer months of the year.

How density currents affect water controllers, water users

Density currents—hydraulic phenomena—have practical aspects of concern to those who regulate reservoirs and those who draw water from them. These currents develop from temperature differentials and to a lesser degree from dissolved and suspended matter; they can affect industrial water use, stream pollution, domestic supplies, and recreation.

All this is well documented by hydraulics specialists of the Tennessee Valley Authority—Albert S. Fry, M. A. Churchill and Rex A. Elder—in a paper now available. It is one of 49 in PROCEEDINGS of September's Minnesota International Hydraulics Convention (ENR Sept. 10, p 25).

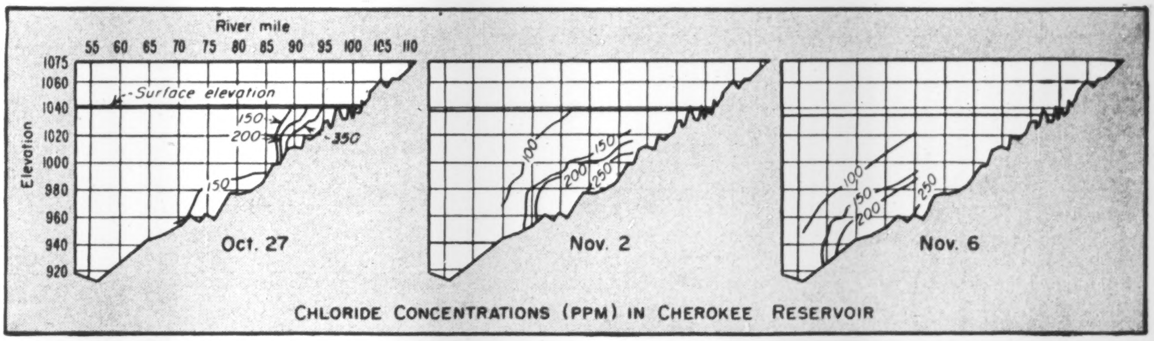
TVA integrates the flows through 30 reservoirs. Day-to-day control of this extensive system is complex, to put it mildly. And one problem adding to the complexity is that of density currents.

In tackling the problem, TVA engineers have sought practical answers to immediate problems. For study of this problem they have used information out of what may well be the world's largest full-scale research laboratory for this purpose.

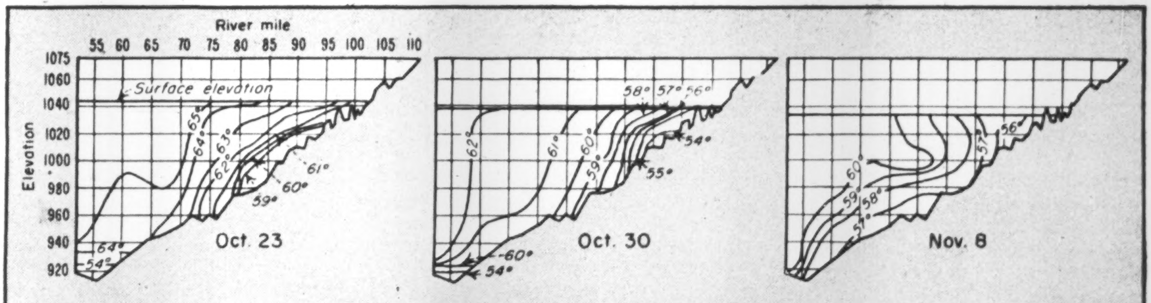
• **Occurrence of currents**—In a reservoir, stored water stratifies according to temperature as the surface layer takes in heat during warmer months. (A graphic picture of the stratification phenomenon is shown left.) This stratification establishes conditions for flow in the reservoir. Water may flow through on the surface, as an interflow, or as a bottom flow, depending on its inflow temperature (and depending also to an extent on its density resulting from dissolved or suspended materials).

Patterns of flow affect a number of problems, including water pollution and water supply. Thus they assume real importance.

Example: On the Holston River system in the northeast end of the Tennessee Valley, releases of cool reservoir water from behind Watauga Dam result in lower river temperatures downsteam than existed before construction of the dam. Similarly, at Kingsport, below Fort Patrick Henry Dam, water will be several degrees cooler than its natural tempera-



TRAVEL OF POLLUTION—A slug of high-chloride chemical waste is traced as it rides a density current along the bottom of Cherokee Reservoir.



TEMPERATURE DISTRIBUTION in Cherokee Reservoir while the pollution travels through indicates how cooler water must flow under warmer wedge.

ture during warmer months. If water use downstream is for cooling purposes, this is beneficial; if use is for processing purposes, it may or may not be beneficial.

• Movement of pollution—Information on time of water passage through reservoirs is essential to an understanding of degrees of self-purification that might take place. Some years ago, TVA engineers traced a slug of high-chloride chemical wastes through the pool behind Cherokee Dam and found how long it took (see the series of diagrams on preceding page). The cooler, high-chloride water was found to enter the reservoir and flow along its bottom to the dam. It traveled 49 miles in 19 days (0.16 ft pr sec)—probably about the minimum time required for passage through the pool.

Similarly in Ft. Loudoun Reservoir, pollution movement by density currents has been a problem. At the upstream end of this reservoir, cool inflow ducks under the pool surface to flow along near the bottom. Warmer water remains on top as a wedge with its thin edge aimed upstream.

Should the flow of cool water from upstream storage be cut off or greatly curtailed, cool water already in the reservoir would stratify and displace warm water, actually causing it to flow upstream.

Water flowing upstream in this reservoir would carry past Knoxville sewer outfalls and to the Knoxville water intake—with obvious ill effects resulting.

Studies of how to keep Knoxville's municipal water supply from being polluted indicated a minimum of 2,000 cfs must be let flow into Ft. Loudoun Reservoir in summer months if Knoxville's wastes were to be kept from flowing upstream past its water intake.

Further studies on Ft. Loudoun Reservoir have determined how much polluted water from the main channel moves up tributary embayments, affecting their recreational use. Density currents were found to move mainstream water up embayments even during times of reservoir drawdown—all flow would be expected to be downstream flow.

• Withdrawals of water—Public and private water supplies can be affected by density currents present in the pools from which these water supplies are taken.

Watts Bar Dam, below Fort Loudoun on the Tennessee, backs water up the tributary Clinch River and its tributary, the Emory. At Harriman, on the Emory, public water supplies are taken—consistent with normal practice—near the upstream end of town. In town, a sanitary sewer outfall and a paper mill discharge their wastes.

Temperature measurements in this Emory arm of the Watts Bar pool have shown that cool water released from Norris Dam, up on the Clinch River, travels down as a subsurface density current; it enters the Emory and flows upstream as a bottom wedge.

Thus, in the summer, the warmer water of the Emory River flows out as a surface current over the upstream-creeping cool wedge of Clinch River water.

Tests showed that on June 29 the Emory River was all Emory River water, flowing downstream; by Aug 24 the only Emory River water flowing in this Emory River arm of the reservoir was a thin layer near the surface.

Here, as in the Ft. Loudoun Reservoir example above, upstream flow is quite possible—and to be avoided as much as possible by dam operation. Upstream flow actually can carry sewage and a paper mill's waste past the Harriman, Tenn., water intake. The paper mill is now set up to barge its digester liquor to disposal points on the Tennessee River, and a new outfall has been built to discharge its other wastes into the downstream-flowing surface layers of the Emory. By regular observations of the river, it is possible to tell management of the mill when to start barging wastes and using its near-surface outfall in the spring, and when it can quit in the fall. A new supplementary waterworks intake farther upstream alleviates to some degree the municipal water supply situation.

• Right temperature for cooling—Kingston steam plant, currently under construction by TVA on a peninsula formed by Emory and Clinch River embayments in Watts Bar Reservoir, offers a cooling water problem affected by density currents. The record-size steam plant will need 2,150 cfs, and eventually 2,470 cfs, of water at 75 F or lower.

A condenser-water intake must be designed to take water of the desired temperature and sufficient volume during months when the reservoir is stratified. Scheduling flows from each upstream hydro plant that may affect temperature at the Kingston plant is practically impossible. Hence, the design must to a large degree tolerate and overcome existing conditions.

Data available show at what water depths the allowable temperature will be found. (Surface waters here reach 90 F in mid-summer.)

Density currents definitely will be the mechanism for delivering water of lower temperature to the intake. It is now up to the hydraulic designers to develop an intake structure through which the needed quantity of desirably cool water will flow without drawing down the warmer top stratum.

This article is based on the paper by TVA engineers mentioned above. Proceedings of the Minnesota International Hydraulics Convention are available from the St. Anthony Falls Hydraulic Laboratory in Minneapolis, Minn.

Silt carried 115 miles in Lake Mead

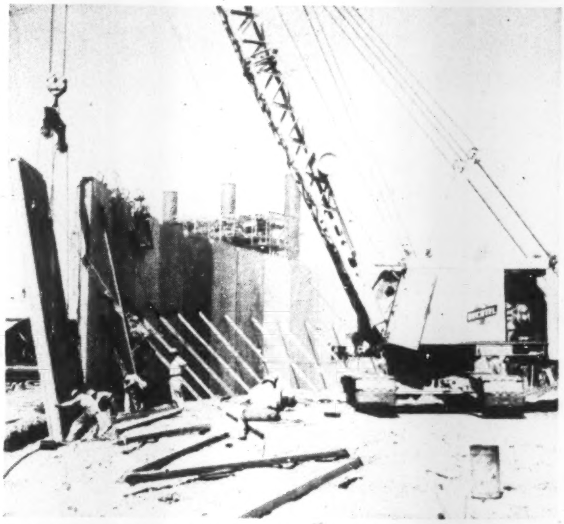
There is now over 100 ft of silt deposited against the upstream face of Hoover Dam—silt mostly washed into Lake Mead by the Colorado River where it enters the vast reservoir 115 miles upstream. Density currents are estimated to have deposited some 65 percent of this silt where it now is found in the reservoir.

These statements are contained in a paper on density currents in Lake Mead, also included in the proceedings referred to in the preceding article. Its author is C. S. Howard of the U. S. Geological Survey.

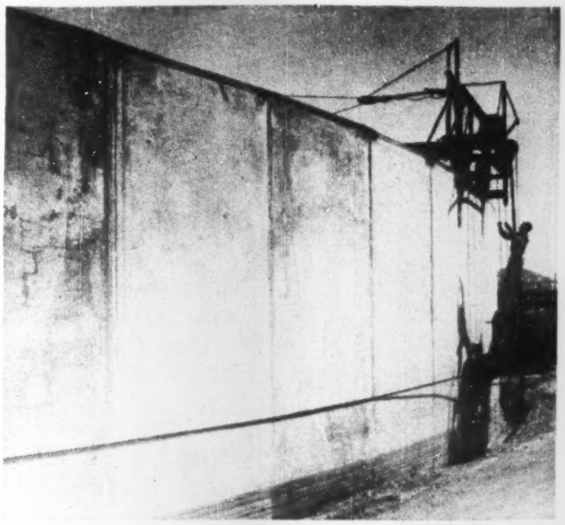
There is ample proof that density currents do exist in Lake Mead, says Mr. Howard. Passage of turbid water through the lake has been recorded. It seems likely that smaller particles of the great amount of sediment brought into the reservoir are carried by density currents to the lower end—that is, to the dam.

When the 1948-49 Lake Mead survey was made, the volume of silt deposited during the reservoir's first 14 years amounted to more than 1,420,000 acre-ft. Since 1936 when the tunnel gates were closed, no appreciable amount of sediment has been allowed to pass the dam. There is now no possibility that any such amount will pass, unless the sediment level rises another 175 ft or so at the dam, to the level of its intake towers. Mr. Howard says there is little likelihood of this happening for many years, especially anticipating that reservoirs will be built upstream.

Silt movement and deposition in Lake Mead furnish valuable evidence on density currents, information that should be of help in planning other reservoirs where it may be desirable to discharge some sediment through the use of density currents, concludes Mr. Howard.



PRECAST CONCRETE elements, 9 ft wide, make up 300-ft dia firewalls surrounding oil storage tanks at the Pittsburg Steam Station of the Pacific Gas & Electric Co. Slabs, 13 in. thick and either 20 or 24 ft high, are set in key in foundation ring. Ordinary roofing paper permits slab movement during prestressing.



WIRE WRAPPING prestresses firewall. Traveling machine draws wire through die, reducing the diameter from 0.162 in. to 0.144 in. and stressing it to 100,000 psi. Wire concentration varies from 116 a foot in three layers at the bottom of the 24-ft high walls to 4 a foot in one layer at the top.

Firewall is precast and prestressed

Firewalls surrounding fuel oil tanks at the new 600,000-kw steam plant of the Pacific Gas & Electric Co., Pittsburg, Calif., are made up of precast concrete elements. After the units are incorporated into 300-ft dia walls, the entire assemblies are prestressed by wire wrapping.

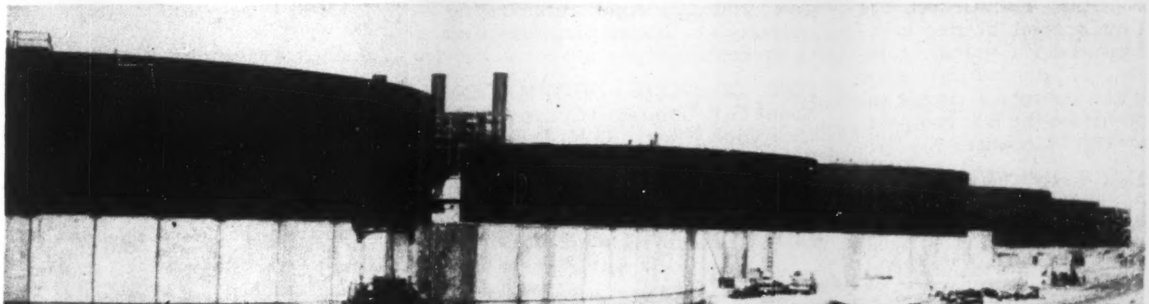
The concrete wall design was favored over the more commonly used earth dikes because of a reduction in the area required (14 acres as against 24 acres) and because of the cost of earth fill at Pittsburg. A precast-prestressed wall was found to be cheaper than a poured-in-place wall largely because of simpler form work.

The six oil storage tanks are 48 ft high and 160 ft dia with a capacity of 168,000 bbl each. Fire safety considerations require that each be surrounded by a wall or dike that would retain the entire contents of the tank should a break develop. But the dredged earth fill available at Pittsburg is unsuitable for embankment construction without special treatment that makes it expensive. Accordingly, an alternate scheme was sought by engineers for Bechtel Corp., designers and builders of the work. Considered were steel walls, earth dikes, and three types of concrete walls, namely: poured-in-place with no prestressing; poured-in-place and prestressed; precast and prestressed. The precast-prestressed design proved most economical. So, a detailed design analysis was presented to PG&E officials who gave Bechtel the go-ahead signal on the work.

On account of an elevation difference, two of the tanks have 20-ft high firewalls while the other four are 24 ft high. But the individual slabs in each case are 13 in. thick and 9¼ ft wide. Two layers of nominal reinforcing provide resistance to lifting stresses.

The slabs are cast six deep, with the concrete crew working on the firewalls when not occupied on the steam plant proper. A bond breaking compound is sprayed on each slab. But in this instance, the substance used proved to be a non-disintegrating type. So after the walls were erected, it had to be sand blasted off to provide bond for the protective gunite coating that covered the prestress wires.

The wall segments are erected by a crawler crane. Temporary bracing



WIRE WRAPPING is under way on firewall in the foreground as joint grouting of slab erection continues on other walls.

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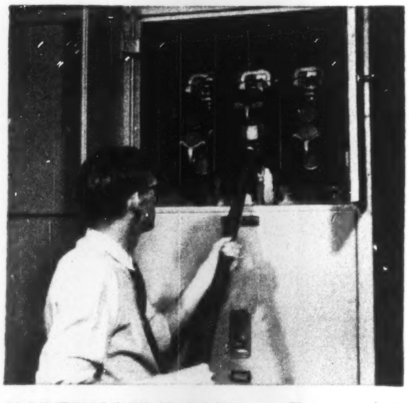

MAINTENANCE IS EASY . . . Fuses swing forward on hinges for the disconnect position and fuses can be quickly lifted out.

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holds the wall in place until grout keys between units can be poured and until the entire circumference can be set. As the prestressing reduced the diameter by some 2 in., the key in the foundation ring was kept smooth. And ordinary roofing paper was laid in the key so that the wall would not bind against it during prestressing movement. After the prestressing was completed, the remaining space in the foundation key was grout filled. Finally, the bottom of the wall was backfilled to a 2-ft depth.

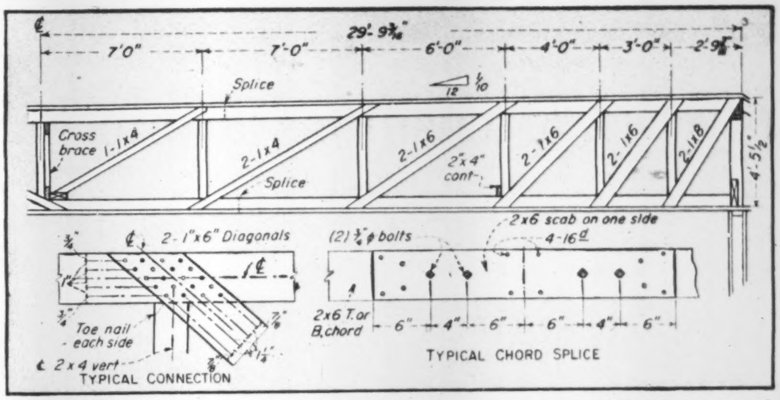
The walls are prestressed by the Preload method. This involves a machine suspended from the wall top that travels around the wall. In so doing a 0.162-in. dia wire is pulled through a die that reduces the size to 0.144-in. dia and stresses the high-tensile steel to 100,000 psi. Wire is shipped in coils 5,000 ft long. Each end of each coil is anchored at special sections located at the third points of the circumference. Thus, there is anchorage for about each 5 strands.

The walls are designed to have zero compression in the concrete when standing full of oil (except for a 2½-ft freeboard at the top). For the 24-ft high walls this requires a maximum of 116 wires per foor of wall height at the bottom. This puts a maximum no-load compressive stress of 1,070 psi in the concrete. Wire concentration is gradually lessened toward the wall top until there are only 4 strands per foot at the top.

Wires are placed in single, double or triple layers depending on the concentration. Each layer is gunite coated as a protection against damage or corrosion. Gunite thickness is 1¾ in. in three layers at the bottom and ¾ in. in one layer at the top.

Precasting of the wall segments resulted in a slightly irregular surface. But there is only a three-degree angular change between segments, and wire wrapping is effective for changes up to five degrees.

Pittsburg steam plant is a unit of the Pacific Gas & Electric Co. expansion program. Walter Dreyer is vice-president and chief engineer for PG&E and civil engineering features of the steam plant work are under the direction of H. V. Lutge and C. W. Appleford. The plant is being designed and built by the power division of Bechtel Corp., J. R. Kiely, vice-president, R. A. Bowman, manager of engineering, E. J. Garbarini, manager of construction, and R. L. Stater, Pittsburg steam plant project superintendent. The firewall design was developed under the direction of J. George Thon, supervising structural engineer. Preload Corp. was subcontractor for wire wrapping.



NAILED TRUSS (half elevation), recently tested in Los Angeles, Calif., demonstrated the adequacy of this type of construction for building roofs.

Nailed trusses prove cheaper than bolted bowstring trusses

Nailed trusses can be comparable in strength with bolted bowstring trusses, and they can also be appreciably cheaper, according to recent cost survey tests carried out in Los Angeles. With rafters and joists on a level with the top chord, the flat, nailed trusses necessitated a 3-ft higher wall than would have been required for bowstring trusses. In spite of the higher wall, the nailed-truss construction showed a 28% saving over the bowstring truss design.

Full-scale tests on the pair of 60-ft nailed trusses indicate that their behavior agrees with recent research on nailed joints. Virginia Polytechnic Institute, after testing nailed and ring-connectored bolted trusses, reported that "nailed trussed rafters provide, under given conditions, equal or better performance with less materials cost than bolted or ring-connectored trussed rafters."

• **Big loads**—Live load for the nailed trusses, which were spaced at 24-in. centers, was 20 psf, and dead load was 9 psf. Deflection under the design load was less than ¾ in. for the 60-ft span. With the live load doubled, the maximum deflection was 1½ in., and when it was removed after being held on the truss for a half hour, the permanent set was only ¼ in. With the facilities available it was not possible to get enough load on the trusses to test them to destruction. However, failure probably would occur through deflection increasing to a point where the secondary stresses in the nailed joints would cause splitting of those components that are perpendicular to the grain of the wood.

The tension splice in the bottom chord probably would fail first. To prevent this failure, a number of 16d nails were used on the splice block in addition to the bolts.

During the test, slippage of joints and elongation of cracks were too small to be ascertained accurately. After completing the test, the trusses were demolished partly to observe the joints. No evidence of nail bending, excessive bearing on the wood, or distortion of the bolted splices was observed to have taken place.

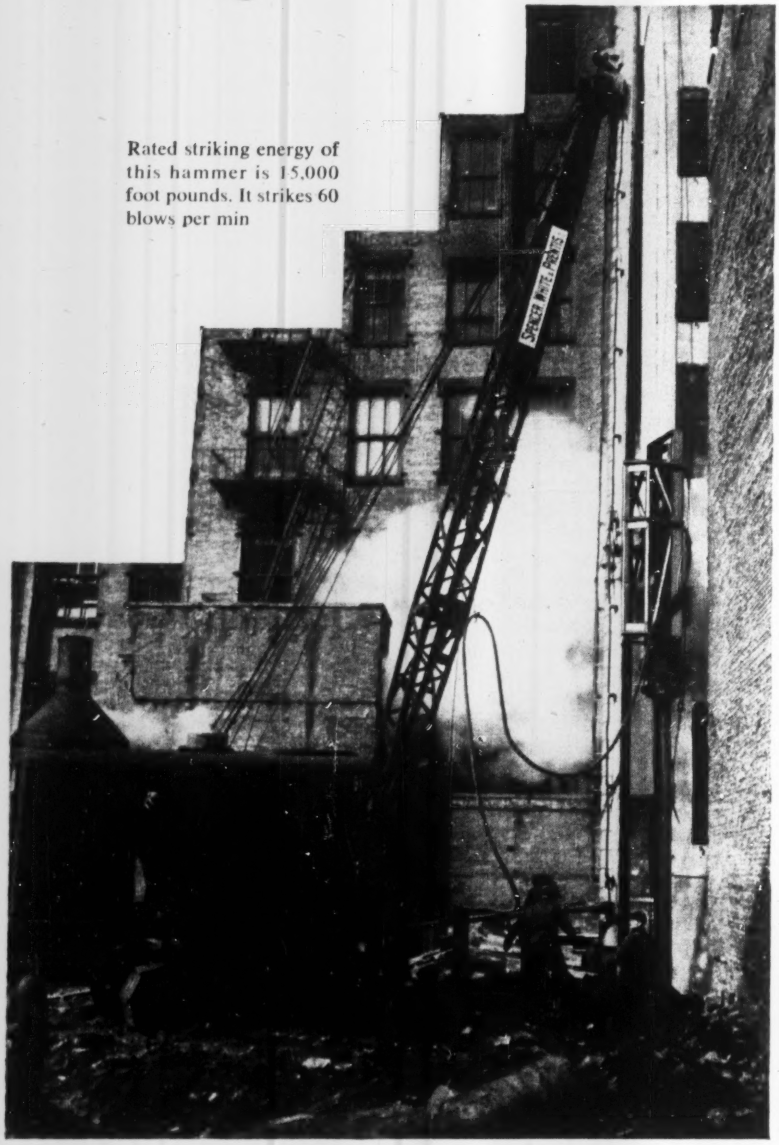
• **Construction care**—The researchers point out, that several precautionary measures should be taken in the use of long-span shallow nailed trusses. These measures are:

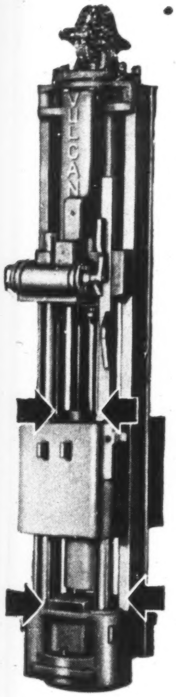
- Because of the slenderness perpendicular to the plane of the truss, erection requires great care.
- Owing to the large number and close spacing of the nails, templets should be used and all nails protruding through the joint should be cut off.
- The vertical compression members and upper-chord splice should be driven tightly together to prevent closing of the joint under load which would result in subsequent deflection of the truss.
- Dry lumber should be used to prevent nail bending, since the wood shrinks if green.
- Owing to the high degree of elastic instability of single trusses, the liberal use of cross-bridging to develop a space framework should be employed wherever possible.

The load tests were conducted by the Smith-Emery Testing Laboratory to obtain data for the design of a building in Van Nuys, Calif. Craig & Randall were the contractors, and Richard R. Bradshaw was the structural engineer, all of Los Angeles, Calif.

"U. S." cushions a pile hammer ...using a 53-year-old design

Rated striking energy of this hammer is 15,000 foot pounds. It strikes 60 blows per min





Arrows indicate the "U. S." rubber bumpers. Despite the terrific series of impacts, they retain their natural resilience.

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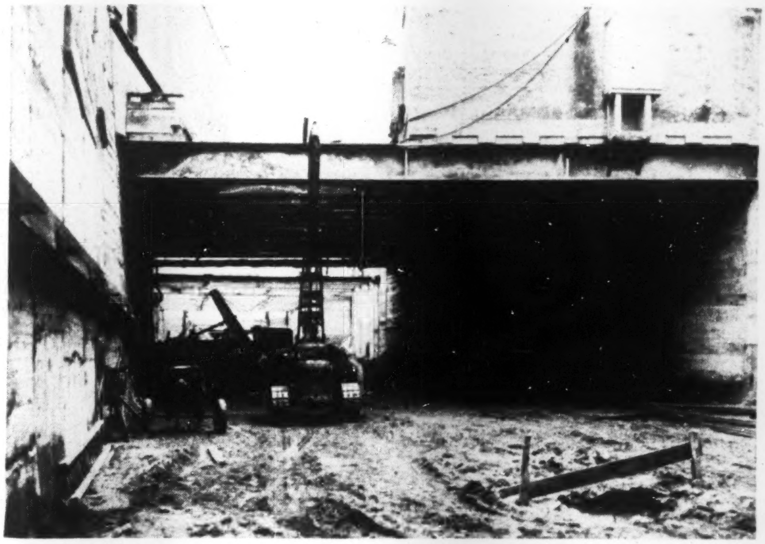


BUSINESS BLOCK UNDER-PASS—To support an assortment of buildings, continuous walls were sunk below subway grade. Then subway excavation proceeded.

Subway builder underpins theater floors on ground

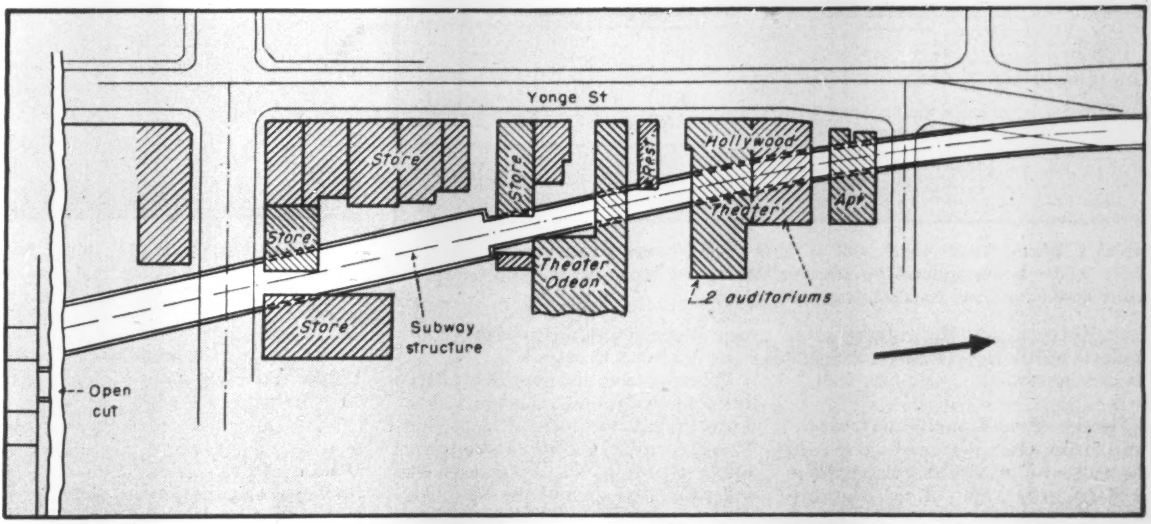
North America's newest subway, now almost ready for operation in Toronto, Ont., has required thousands of feet of underpinning for adjacent buildings—just as have the subways in other cities. Most of this underpinning has been conventional, providing new permanent support to existing foundation walls and footings.

But in addition, the Canadian job included a condition not widely encountered in underpinning work — broad expanses of concrete floor bearing directly on the ground. These were theater floors under which the 34-ft wide subway cut had to pass. Because of the plain-concrete floors' almost total lack of beam-action properties, precast concrete planks were placed under every square foot of floor to be supported. The planks in turn were supported by steel beams resting on concrete walls bordering the subway cut.

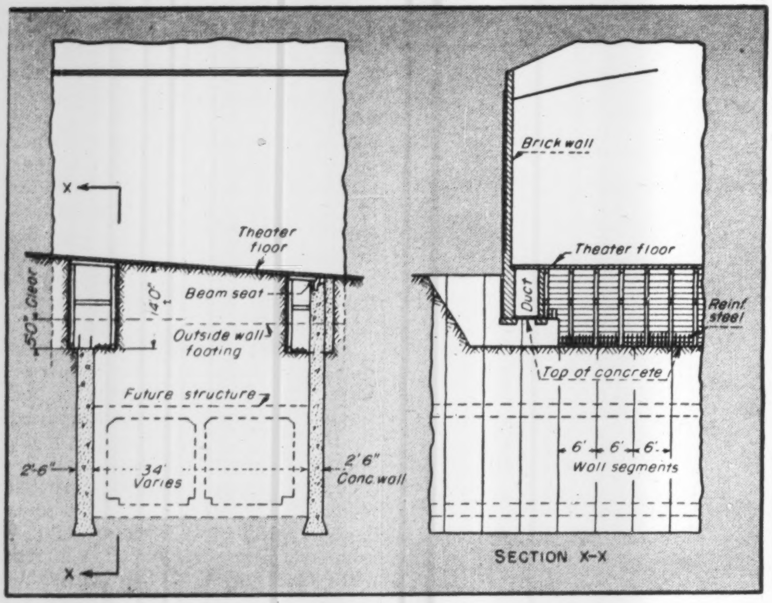
The theaters are in a business block near the northern end of the 4½-mi subway, where the route swings diagonally underground from an open-cut section into Yonge St., the city's main north-south artery. The subway emerges a short distance farther north, where there is a train-storage yard and a terminal. Lower portions of the location include 2.3 miles of cut-and-cover line, under Yonge St. in the main business district, and the open-cut section on private right-of-way. (ENR June 29, 1950, p 36; Apr. 13, 1952, p. 57.)

Underground construction requires that the subway's twin-box structure carry no buildings. Because of the number of buildings to be supported in the 700-ft block containing the theaters (see plan, below), it was decided to build continuous, parallel walls throughout the block. To serve both as retaining walls and as building supports, these reinforced concrete walls were sunk three feet below subway structure level; then subway excavation and construction proceeded within the walls, which were 2½ ft thick and strutted with steel beams. For the most part, both under buildings and out in the open, standard underpinning methods were used to build the walls. This consisted of digging sheeted pits in alternate six- or eight-foot sections along the wall location, placing reinforcement and filling them with concrete, then returning to dig and concrete the gaps.

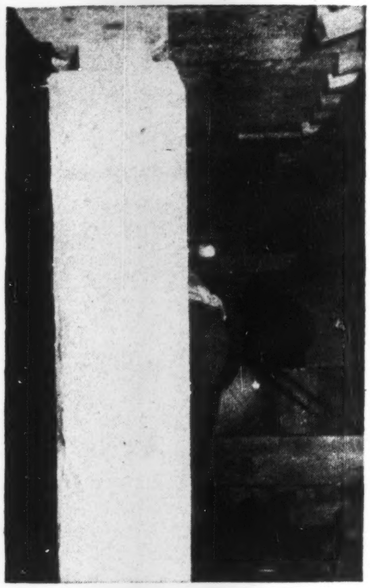
Where the walls intersected building walls the latter were supported temporarily on needle beams, then their loads were transferred to the new walls. Mostly the underpinned building walls bore directly on steel beams spanning between the new walls, but where a building projected only a



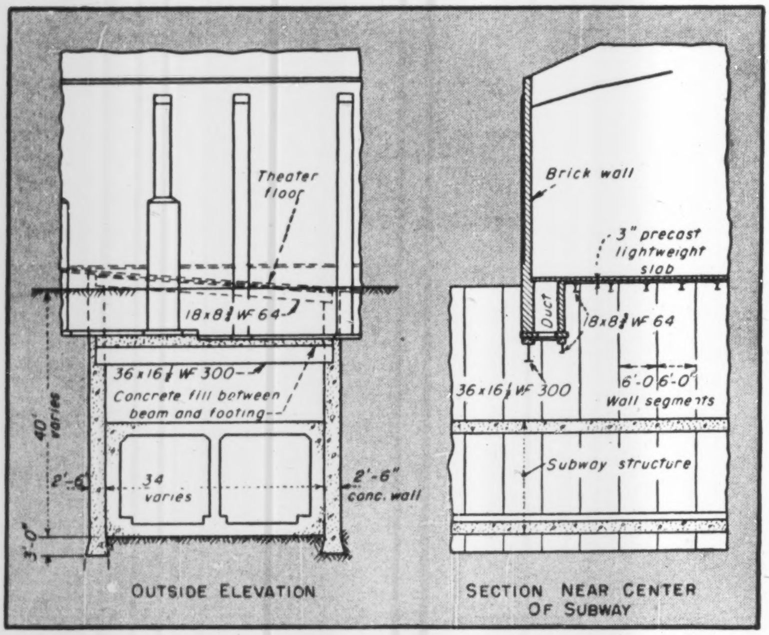
TRANSITION—Subway swings under 700-ft block, connecting open-cut section (left) with underground section in Yonge Street. Floors of Odeon and Hollywood theaters, being plain concrete on ground, were underlaid with precast slabs.


X
Theater floor
Beam seat
14'0"
5'0" Clear
Outside wall footing
Future structure
2'-6"
34' Varies
2'6" Conc wall
X
Brick wall
Theater floor
Duct
Reinf. steel
Top of concrete
6' 6' 6'
Wall segments
SECTION X-X

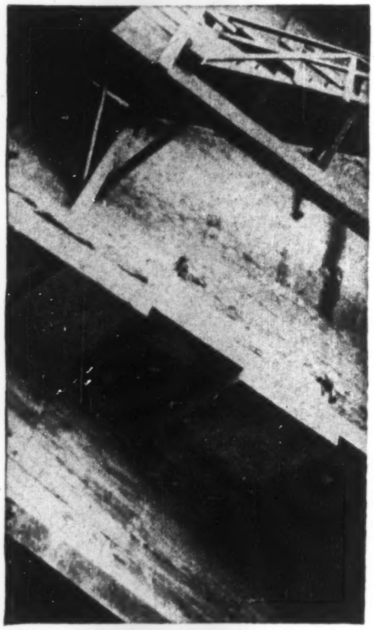
THEATER SUPPORT began with tunnels that were approach pits to wall excavations; wall, built in alternate sections, goes below subway grade. Subway structure will carry only its earth backfill.



UNDER FLOOR of theater, precast slabs are supported by temporary post as well as by permanent beams.


Theater floor
18x8¾ WF 64
36x16½ WF 300
Concrete fill between beam and footing
40' varies
2'-6"
34 varies
2'-6" conc. wall
3'-0"
OUTSIDE ELEVATION
Brick wall
3" precast lightweight slab
Duct
18x8¾ WF 64
36x16½ WF 300
6'-0 6'-0
Wall segments
Subway structure
SECTION NEAR CENTER OF SUBWAY

HEAVY BEAM carries south wall of Hollywood Theater across subway excavation (left); lighter beams spanned by precast slabs support floor. Beams were brought in under outside wall and installed progressively inward.

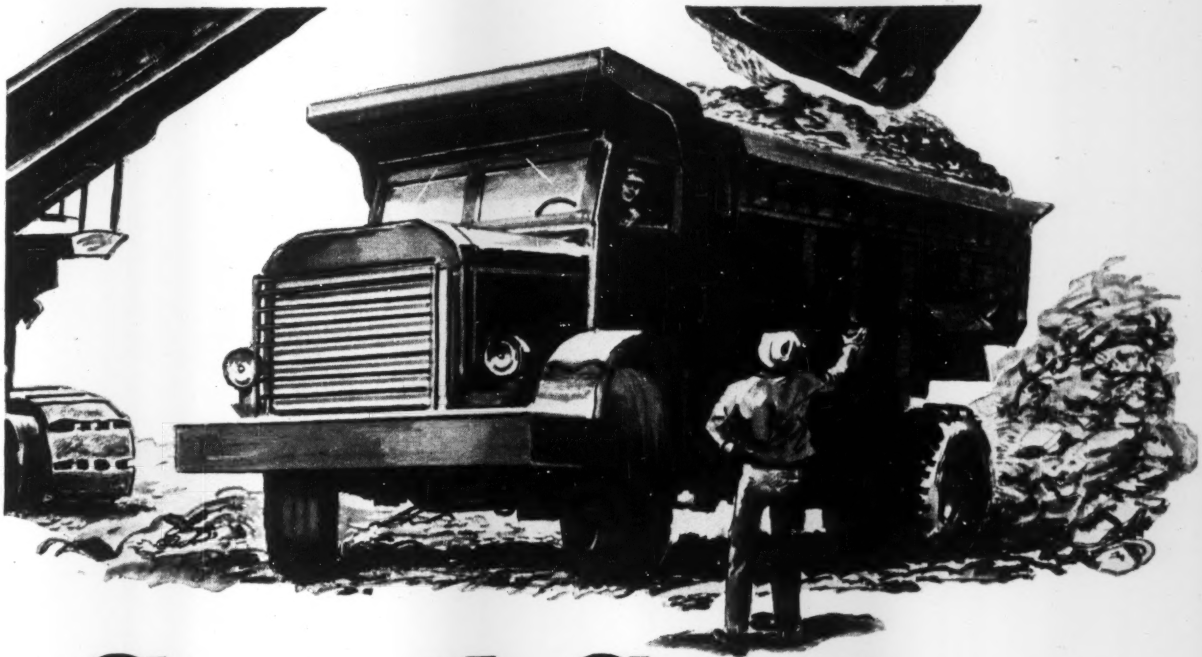


CANTILEVER SUPPORT (lower left) is provided for a building that projects only a few feet into subway excavation.

short distance into the subway excavation it was carried on concrete brackets cantilevered from one new wall.

• Theater floor support—Accompanying illustrations show cross-sections of the walls and subway at a point where they go under one of the theaters. After the theater's exterior brick wall was supported by a 36-in. 300-lb WF beam resting on the new walls, workmen began floor-underpinning operations.

Working from the approach pits for new-wall excavation, they mined inward toward the subway centerline. This cut, just inside the building wall and parallel to it, was 7 ft wide—a foot wider than the span of the 3-in. lightweight precast reinforced concrete slabs that would support the floor. As the men exposed the underside of the floor they placed the slabs and supported them temporarily on posts. When the excavation was complete they brought an 18-in. 64-lb. WF beam in under the building wall and seated it in position on the new walls. Wooden wedges were driven between the beam and the precast slabs to obtain correct level for the theater floor, then the wedges gradually were replaced by grout.



Smooth Starts mean low operating costs

When a rear-dump truck pulls away smoothly from a shovel with a 30-ton pay load – without jolts and jerks – it's sure to stay on the job longer with less down time.

Trucks equipped with Allison Torqmatic converters and transmissions always start smoothly – because Torqmatic Drives absorb these shocks instead of transmitting them to other truck parts.

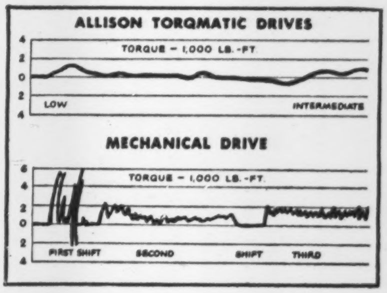
To demonstrate this, Allison engineers measured power-train shock loads in a large number of earth-moving, coal and ore-hauling trucks under both normal and extreme operating conditions. These charts show the results.

Trucks equipped with Allison Torqmatic Drives showed starting shock loads four times less severe than trucks using mechanical drives. Furthermore, trucks equipped with Allison Torqmatic Drives were *quick-shifted* at full throttle.

If you're operating off-highway trucks or other heavy-duty earth-moving equipment, specify Allison Torqmatic Drives, the matched team of torque converter and hydraulic transmission. Ask your dealer, equipment or engine manufacturer for further information or write to:

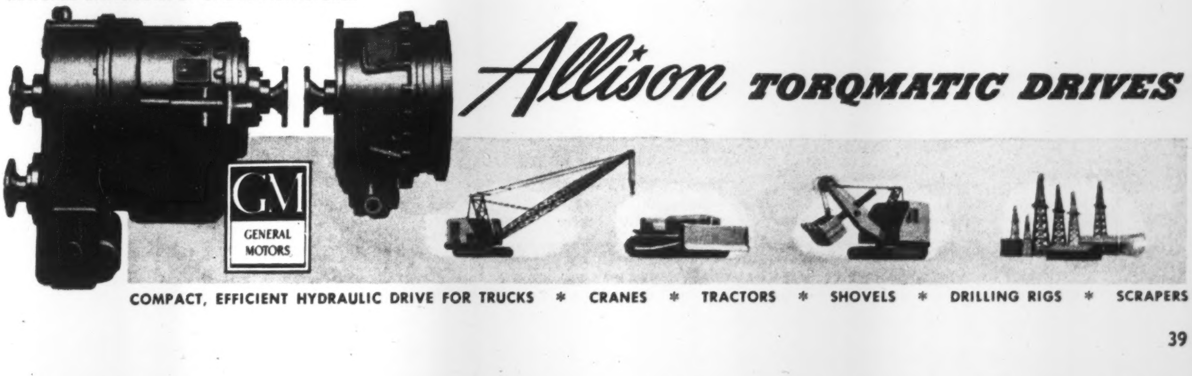
ALLISON *Division of* GENERAL MOTORS
Box 894EE, Indianapolis 6, Indiana

POWER-TRAIN SHOCK LOADS



Note the jagged line – shock loads – as the mechanical drive truck pulls away from the shovel and shifts from first to second gear. Compare the smooth line – no harmful shock loads – for the truck equipped with Allison Torqmatic Drives.

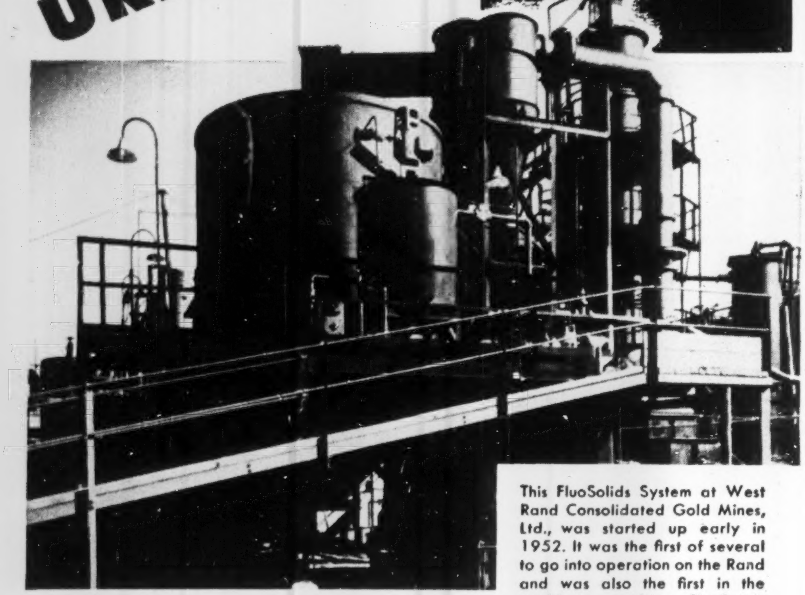
MATCHED UNITS BUILT BY ONE MANUFACTURER



Allison TORQMATIC DRIVES

COMPACT, EFFICIENT HYDRAULIC DRIVE FOR TRUCKS * CRANES * TRACTORS * SHOVELS * DRILLING RIGS * SCRAPERS

GOLD
SO_2
URANIUM
from a single source
?



This FluoSolids System at West Rand Consolidated Gold Mines, Ltd., was started up early in 1952. It was the first of several to go into operation on the Rand and was also the first in the world to combine FluoSolids roasting of pyrites with a contact acid plant.

Gold, SO_2, Uranium . . . all from the same raw material! Improbable combination, but it's standard procedure on South Africa's fabulous Witwatersrand. Gold is recovered from ore by conventional methods; mill tailings are roasted to produce SO_2 for acid manufacture; uranium is recovered from tailings by a sulfuric acid leach.

Important part in this unique process is the Dorrco FluoSolids System, which insures a cheap, abundant source of sulfuric acid for the leaching step. Utilizing the principle of fluidization, this major advance in roasting techniques makes it possible to produce a high-strength SO_2 gas for acid manufacture from low sulfur content material.

Whenever a process involves the separation of finely divided solids in suspension, the use of ion-exchange, or fluid techniques, the chances are we can help you turn your imagination into money.

FluoSolids is a trade-mark of The Dorr Company, Reg. U.S. Pat. Off.

Better tools TODAY to meet tomorrow's demand

DORRCO

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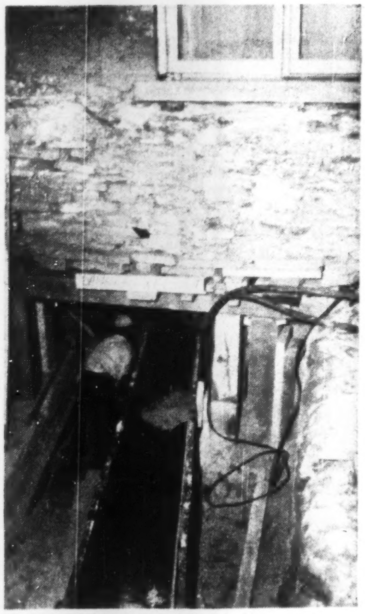
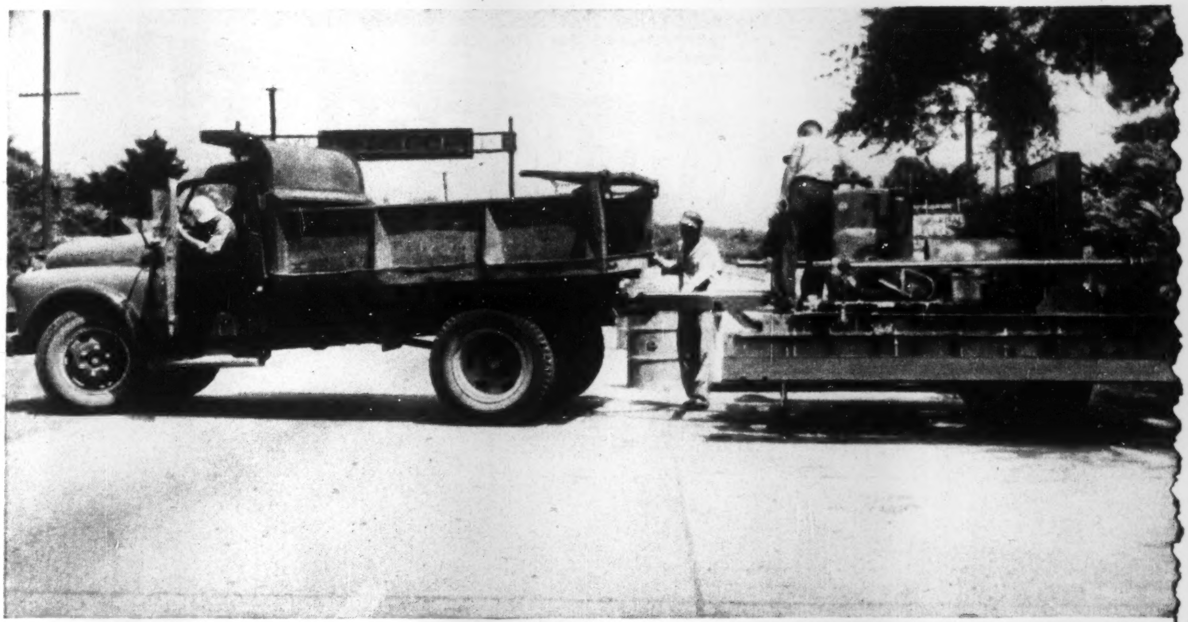


EARTHMOVING AID was belt conveyor that brought dirt from approach pits.

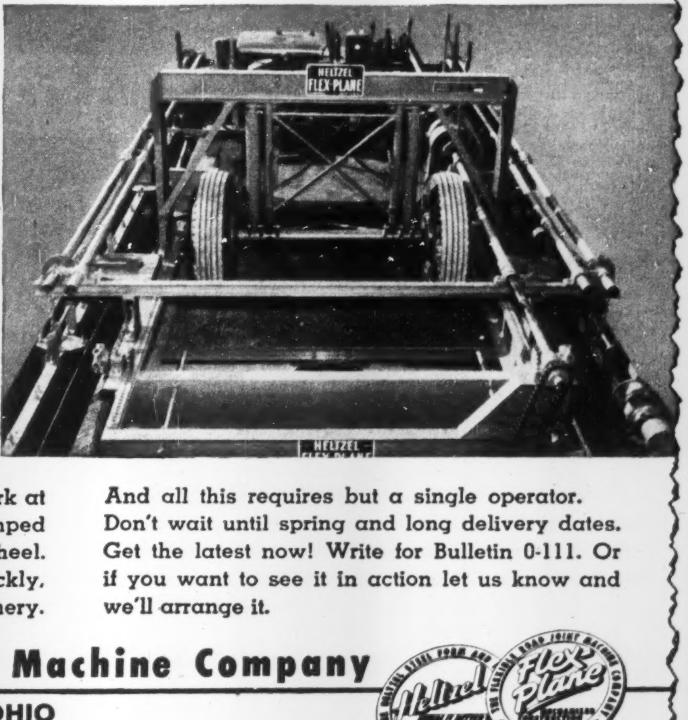
The same procedure—mining, placing and temporarily supporting slabs, installing the beam and leveling—was repeated for the next 5- or 6-ft span of floor as well as for the following ones, until the whole floor area was supported. Subway excavation then could proceed.

• **Quicksand in pits**—One other feature of underpinning on the Toronto subway is notable: the method that Rayner Construction Ltd. Leaside, Ont., found successful for overcoming a bad ground water condition in some of the 40-ft deep pits for the new walls. Encountering quicksand about 30 ft down, Rayner backed up to the 15-ft depth and enlarged the pit's inside short dimension from 2½ to 5 ft, running the regular horizontal full sheeting downward to the 30-ft depth at this enlarged dimension. He then drove vertical tongue and groove sheeting down to design depth and proceeded with excavation until quicksand inflow became troublesome again. At that point he injected a cement grout into the quicksand, in and around the lower end of the sheeted enclosure. The grout set up, forming a plug or seal that permitted completion of the excavation. Before the grout was adopted, chemical injections of calcium chloride and sodium silicate were tried without success.

When the pit was concreted a form was built on the subway side of the pit's enlarged zone, in line with the pit's normal face on that side, so that the concrete would not project into subway construction space.



No Other Finishing Machine Can Do This!



No other finishing machine has the "get up and go" you'll find in the Flex-Plane Detroit Special. Here's super portability that slashes lost crew time to an absolute minimum. Thoroughly job tested on hundreds of highway, airport and municipal paving jobs, the extreme maneuverability of the Special is verified by any one of the contractors who are using this amazing machine . . . and, in case after case, they will substantiate formidable on-the-job savings. From a central hydraulic control panel the operator merely flips a switch to lower the main wheels . . . another flick and the towing tongue is hydraulically adjusted to truck hitch. It's easier and simpler than attaching a small trailler, and minutes later it's ready to go to work at a new pouring area. For tight turns and cramped areas the Special can be fitted with a nose wheel. It will lift itself off and on the forms, quickly, without the need of cranes or other machinery. And all this requires but a single operator. Don't wait until spring and long delivery dates. Get the latest now! Write for Bulletin 0-111. Or if you want to see it in action let us know and we'll arrange it.

The Flexible Road Joint Machine Company

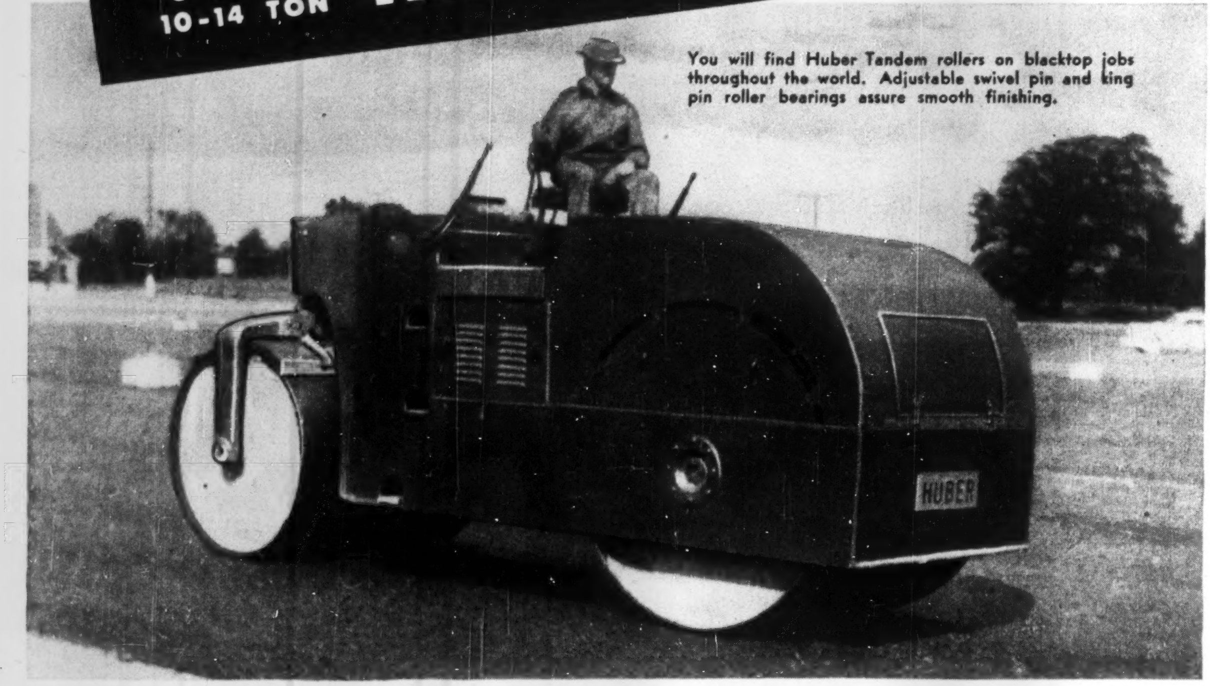
WARREN, OHIO

CONSTRUCTION EQUIPMENT SINCE 1910

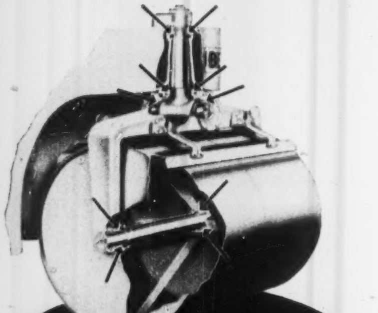
HUBER

The only roller that can give "factory new" guide roll performance for the life of the machine . . .

8-12 TON
10-14 TON TANDEM ROLLERS



You will find Huber Tandem rollers on blacktop jobs throughout the world. Adjustable swivel pin and king pin roller bearings assure smooth finishing.



Adjustable tapered roller bearings for swivel pin, king pin and roll axle.

Only Huber Tandem Rollers can give you "factory new" guide roll performance for the life of the machine. The reason: only Huber has adjustable tapered roller bearings on both ends of the long swivel pin, as well as on the king pin and the roll axle.

Simple adjustments in the field keep the entire guide roll assembly "factory new" in performance. There is no looseness, no wobble to cause scuffing.

The full story of these and other features of the Huber 8-12 ton and 10-14 ton tandem rollers are described fully in Bulletin T-152. Write for a copy or see your nearest Huber representative.

HUBER MANUFACTURING COMPANY
MARION, OHIO, U.S.A. — Since 1863

MANUFACTURERS OF HUBER MAINTAINERS, GRADERS AND COMPLETE LINE OF ROLLERS

NORTHLAND SHOPPING CENTER—Parking lot accommodates 916 cars. At left is a truck route from the center basement.

Shopping center has 7,500 car spaces

Safety and parking are stressed in new development planned with 4500 additional spaces when warranted

Detroit observers are watching with considerable interest the activity on an extensive tract of land in Southfield Township on the limits of the motor city.

The J. L. Hudson Company of Detroit is transforming 162 acres of a 409 acre plot into what is regarded by some as the best-planned shopping center in the country today. Seventy acres of the tract are set aside for immediate use as a parking and planted area. The basement area of the buildings covers 15 acres.

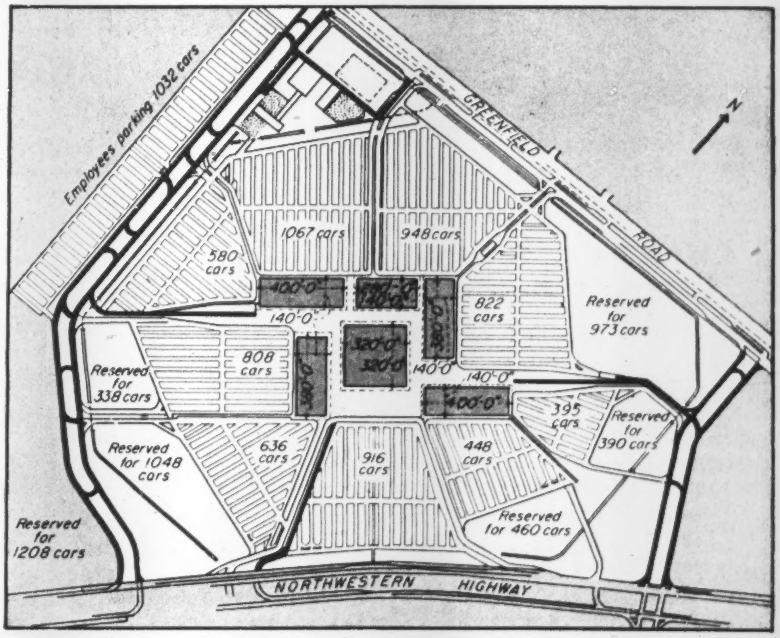
Victor Gruen, architect, and his assistant Karl Van Leuven, Jr., who handled the planning in the Gruen Detroit office, made the layout so that pedestrian shoppers never will find it necessary to cross delivery routes.

A truck access road leads down a ramp into the cavernous shipping-storage area in the basement section of the center. Here, all buildings will be furnished with angled receiving platforms so that one side and the rear of each vehicle will have a parallel platform adjacent to it. All buildings will be accessible from the service tunnel, and two ramp exits will conduct commercial traffic out of the basement section in two directions and out into highways unhampered by vehicle or pedestrian crossways.

• Cart before the horse?—Since the center is scheduled for opening in March, 1954, it was decided to do all paving, marking and planting in the initial stages of the construction program. There is no doubt that this phase of the work was expedited through not having to contend with spring rains and mud. But J. G. Campbell, general job superintendent for Bryant & Detwiler, the contractors, says that there have been drawbacks. On a few occasions finished blacktop or concrete had to be chipped out and removed to allow performance of one of the phases of construction.

The main shopping plaza features wide malls and landscaped courts

(Continued on page 44)



Employees parking 1032 cars
GREENFIELD ROAD
N
1067 cars
948 cars
580 cars
400'-0"
280'-0"
140'-0"
300'-0"
140'-0"
822 cars
Reserved for 973 cars
808 cars
320'-0"
320'-0"
300'-0"
140'-0"
140'-0"
Reserved for 338 cars
400'-0"
395 cars
Reserved for 390 cars
Reserved for 1048 cars
636 cars
916 cars
448 cars
Reserved for 460 cars
Reserved for 1208 cars
NORTHWESTERN HIGHWAY

LAYOUT FEATURES SAFETY—Commercial traffic (black line) enters below grade at northeast, exits at southeast and southwest. Pedestrians never cross main routes.

IF IT'S A WET JOB

PLAY SAFE! ASK FOR A DEWATERING ANALYSIS BY

GRIFFIN WELLPOINT CORP.

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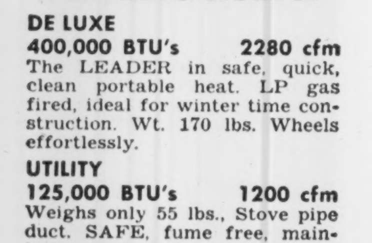

HOTTER LIGHTER CHEAPER

CHINOOK WIND Portable Heater

DE LUXE
400,000 BTU's 2280 cfm
The LEADER in safe, quick, clean portable heat. LP gas fired, ideal for winter time construction. Wt. 170 lbs. Wheels effortlessly.

UTILITY
125,000 BTU's 1200 cfm
Weighs only 55 lbs., Stove pipe duct. SAFE, fume free, maintenance free. Low price, low operating cost. Light weight.

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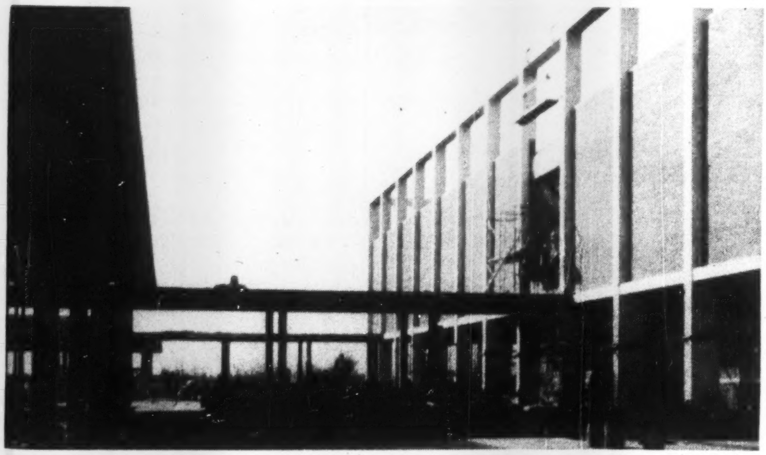
Dealerships open in some territories.

INTERNATIONAL MFG. CO.
2249 S. Delaware Denver, Colo.



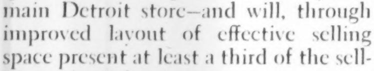
COVERED WALKWAYS give shoppers sheltered passage from building to building, and along the exterior of all buildings. Malls are landscaped.

which separate the buildings. The general layout is dominated by the central structure—to be occupied by the J. L. Hudson Company itself. This building is a 3-story one with reinforced concrete frame of conventional type with exterior wall panels of wire-cut brick contrasting with the white of the columns.

The new Hudson store, the biggest suburban store in the world, will have 462,000 sq ft of floor area—about a quarter of the space offered by the main Detroit store—and will, through improved layout of effective selling space present at least a third of the selling area of the downtown store.

All buildings will be surrounded on all sides by 14-ft covered walkways connecting all areas. All four sides of every building are store-fronts.

At the corner of one building is a self-service market with a conveyor belt from the packaging section to an outside pick-up station, thus enabling shoppers to walk unencumbered to their cars and then drive to the pick-up platform for their purchases.



MACHINE ROOM north and south walls (louvered panels) screen a masonry wall that bears air-conditioner vents and intakes.

All buildings, with the exception of the main store, will be one-story with display windows on all sides. The central structure is designed for a fourth sales floor if the need arises. Clips and conduit have been carried to the present roof in order to minimize the cost of the future expansion. The exterior framing, extending one story above the existing roof, is decorative, enhancing the clean lines of the structure, but it has the twofold purpose of being fully convertible into the outerwall framing for the future top story.

Rising like a large cupola in the mid section of the main building is the machine-room housing. The north and south walls of the housing are completely louvered in 20-ft panels. Three feet behind the louvers is a cinderblock structural wall through which the necessary intakes for air conditioning, venting, etc., are carried. In this manner, all unsightly openings are screened by the louver panels.

Approximately 750 ft from the store group will be an 18,000-sq ft restaurant with its own parking facilities. A suburban branch of Detroit's Stouffer Restaurants will occupy the property.

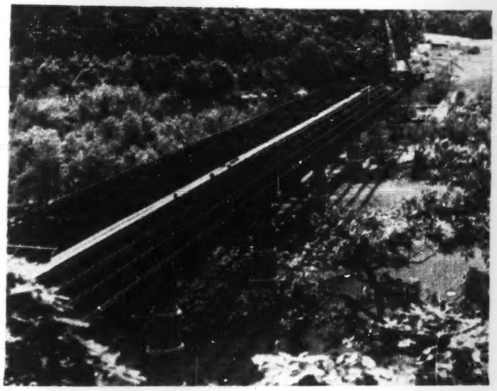
Each of the 70-odd store spaces in the project has been spoken for, and practically every conceivable merchandise and service will be available there to suburban and urban Detroiters.

Highways on the perimeter have been widened and revamped to allow easy access for shoppers and commercial delivery vehicles.

(*Municipal continued on page 47*)

Three New Bridges Span the Delaware

To provide greatly increased facilities for crossing the upper Delaware River in the general area of the Delaware Water Gap, three new bridges together with elaborate approaches have been built for the Delaware River Joint Toll Bridge Commission. Steel for the bridges and the approaches, shown under construction, was supplied by Bethlehem, and included piling, fabricated steel, reinforcing bars, dowel units and bar mats.

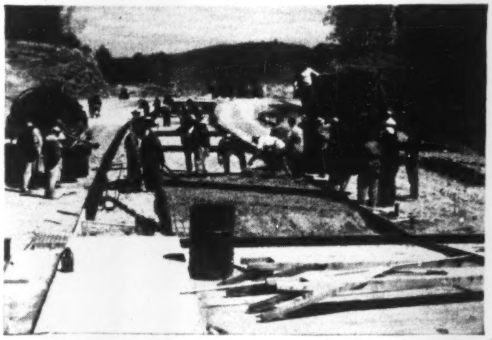


Superstructure of bridge crossing the river at Delaware Water Gap. *Below:* Bridge across the Delaware between Milford, Pa., and Montague, N. J.

Bethlehem Reinforcing Bars come to the job site at Portland-Columbia bridge, ready for immediate placing.

Right: Paving one approach to bridge across Delaware river connecting Portland, Pa., and Columbia, N. J.

Below: Bethlehem Dowel Units being installed in the Pennsylvania approach to the Delaware Water Gap bridge. Contractor: George M. Brewster & Sons, Inc.



J. E. Greiner Co. were the engineers, and Johnson, Drake and Piper, Inc., the general contractors, for the substructure of the three bridges.

Paving contractors for the approaches were A. L. Rake and Son and G. H. Litts (for the Milford, Pa.-Montague, N. J. bridge), George M. Brewster & Sons, Inc. (for the Pennsylvania approach to the Delaware Water Gap bridge), and S. J. Groves and Sons Co. (for the Pennsylvania and New Jersey approaches to the Portland-Columbia bridge, and the New Jersey approach to the Delaware Water Gap bridge).

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BETHLEHEM STEEL

Bethlehem Products for Bridges and Highways include:

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*Plastiment consistently produces higher structural values in concrete because it limits and controls the growth of water-consuming cement gels during mixing and placing of concrete. This action reduces the water-cement ratio and retards the set of all concretes, plain or air-entrained, regardless of type of cement or aggregate. Uniformity of set and water content (the governing factors of uniform concrete quality) are made possible by changing Plastiment proportions with concrete-placing-temperatures and field conditions.

Controlled set and uniformly low water content — exclusive with Plastiment — means less segregation, shrinkage, cold joints and other defects, greater uniformity and resistance to abrasion, cracking and leakage.

Write for your copy of "Plastiment, Concrete Densifier." For specific information on how Plastiment can benefit your own concrete projects, check with our engineering staff today.

PLASTIMENT CONCRETE DENSIFIER

CONTROLS SET AND REDUCES WATER CONTENT WITHOUT INCREASING AIR CONTENT FOR THESE EFFECTS

UNIFORMITY
CRACK RESISTANCE
WATER TIGHTNESS
SURFACE HARDNESS

IN THIS WAY ▸

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Field installations and laboratory tests prove Plastiment's beneficial influence on uniformity, impermeability and resistance to cracking and abrasion.

Plastiment-concrete has been used in many of the world's outstanding projects — floating concrete drydocks, U. S. Navy — concrete ships and barges, U. S. Maritime Commission — Pier 57, New York — the world's largest prestressed concrete bridges and tanks — Metropolitan housing projects, Los Angeles and San Francisco — Gateway Center Buildings, Pittsburgh — and many others.

City manager quits

Veteran official stands ground in controversy over causeway project

More than two weeks of pressure to keep him on the job, have failed to sway Claude A. Renshaw's decision to resign as city manager of the city of Miami Beach, Fla.

The veteran official's resignation came as the result of a bitter controversy over the construction of a $15-million causeway to span Biscayne Bay and link Miami Beach with the city of Miami.

Renshaw's 28 years of service with the resort city is believed to be the longest city managerial term in the U. S.

- **Here's how events developed**—Renshaw and City Engineer Morris N. Lipp (who also doubles as assistant city manager) collaborated in a written report condemning a proposal that the city council accept an offer by the Allegheny Asphalt & Paving Co. of Pittsburgh, to construct the causeway.
- Four members of the 7-man city council over-rode the Renshaw-Lipp recommendation and voted to accept the Allegheny proposal.
- Renshaw summarily resigned.
- Councilmen, doing an about-face, voted 6-1 and rejected the causeway proposal.
- The Dade County Grand Jury, looking into the matter, summoned the indecisive four for questioning.
- Renshaw, stating that his resignation stands, is winding up his work, and expects to be through "early this week."
- If Renshaw stands pat—and he insists that he will—the council probably will appoint Lipp, a 27-yr Miami Beach employee, as his successor.

Claude A. Renshaw—Resigns

- **This is the background** behind the conflict.

The Pittsburgh firm proposed to build the causeway connecting 36th St., Miami, with 41st St., M. Beach. Under the proposal, the firm would do all the preliminary engineering, prepare plans and specifications, then the city would call for competitive bids—with Allegheny also having the privilege of bidding for the construction work.

Renshaw and Lipp, in their report, called the scheme "a blank check indorsed by the city" and "an order to Allegheny to build us a causeway and then send us the bill."

They aimed their criticism against a provision in the Allegheny proposal that would require the successful bidder to take revenue bonds backed only by causeway tolls in payment for the job. "It tends to reduce and possibly eliminate competition," their report declared.

Disapproval was also registered against the lack of preliminary and traffic surveys to determine justification for the causeway. Renshaw and Lipp pointed out that the city of Miami which would have an important stake in such a venture, and the Florida Internal Improvement Fund trustees, who would have to provide right-of-way over most of the bay bottom lands, had not been consulted.

However, after listening to the report, Mayor Harold Shapiro and three councilmen voted to sign the Allegheny committment. It was then that the city manager turned in his resignation.

The next day, three of the four-member council majority (including the mayor) reversed themselves and rejected the proposal.

In the meantime, additional information was brought to light by the local press. In February, 1951, an Allegheny County grand jury indicted the co-owners of Allegheny, along with two of their contracting firms, on "free work" charges growing out of a Pennsylvania state investigation. An Allegheny spokesman, Earl Reed, declares that charges pending against the company are three years old and were filed during a political controversy.

Erosion project succeeds

Citizens of Shawnee, Okla.,—pop. 22,948—are convinced that erosion control pays off. The city has spent

(*Continued on page 48*)

"GUNITE"
THE PNEUMATIC MORTAR FOR

Dam Repair and Reconstruction
Reservoir Lining
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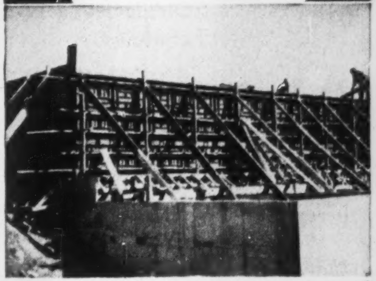

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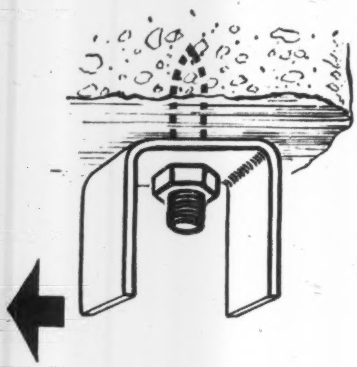

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$8,500 on a 3-year conservation project, and it figures its net savings in operating costs last year at $15,000. The savings came mostly from the reduced expense of purifying the water.

• Here's what they did—They first of all seeded the land to grass, then they built 79 de-silting basins. Finally they put in 12 mi of diversion terraces and built firebreaks to protect the grass and trees.

The success of this program in keeping the red soil from slipping down into the 300-acre reservoir has led farmers to take similar measures, and has set a pattern for other cities faced with erosion problems in watershed areas, according to the International City Manager's Association.

Controversy's over

Vote ends bitter fight over sewerage financing

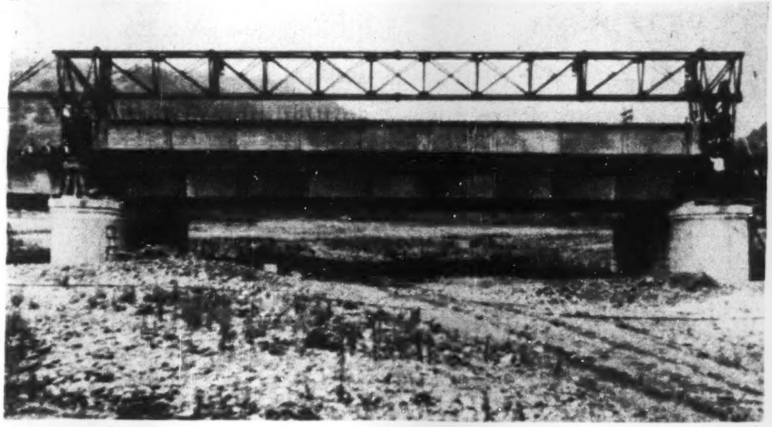
With the approval in the November elections of a $6-million bond issue, one of the longest and bitterest controversies over sewage disposal came to an end in Louisville, Ky. A proposal to construct a $12-million plant that would reduce pollution in the Ohio River saw the city at loggerheads, for almost a year, with the Louisville Metropolitan Sewer District on the question of financing the installation (ENR Dec. 18, 1952, p. 55).

Each side claimed inability to finance the project without outlandish assessment on an inequitable basis.

• Work cut off—City Hall and the LMSD, under pressure from state pollution control officials, passed the blame for delays back and forth until an exasperated Kentucky Water Pollution Control Commission ordered all sewer extensions work closed down (ENR, March 19, p. 48) until some definite treatment plans were formulated.

• On again—Then in May, the commission, with the submission by the district of plans to finance the treatment plant out of increased sewer charges or by the imposition of a storm water levy, reversed its previous decision, and granted approval to the LMSD for the construction of 19 extension projects.

The new bond issue, to cover half the cost of the plant, is a city proposition, but plans call for the sewer district to finance the other half through revenue bonds to be amortized by increasing rates charged to users.



75-FT SPAN, for 1,520-ft long bridge in Sicily, consists of five hollow longitudinal beams made of precast vacuum concrete sections.

Precast prestressed concrete bridge weighs only 140 psf of roadway

One of the lightest prestressed concrete bridges on record—for its use and span—was recently completed in Sicily. Comprising 17 spans of 75 ft and four spans of 62 ft, the 1,523 ft roadway bridge is made of hollow beams cast vertically in sections like pipe. One 7-ft 2-in. high form was used to cast all 950 beam sections for the bridge. The dead load of the whole structures is only 140 psf of highway surface provided.

With the top forming part of the structural road slab the box-like hollow is 3 ft. 7 in. deep and its walls are 4 in. thick. Assembled and tensioned at the bridge site, the prestressed beams are placed five abreast on 4-ft 9½-in. centers to form the 29 ft 6-in. width of the span.

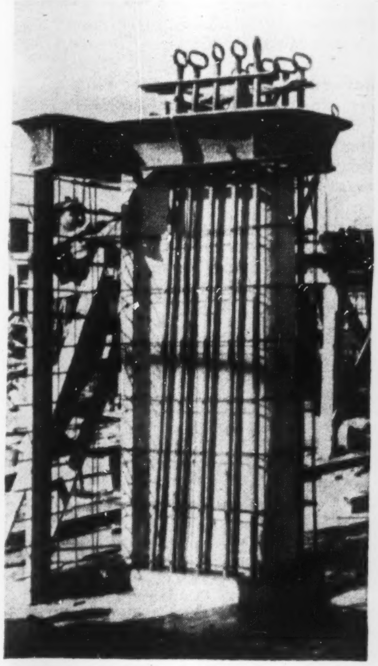
The casting yard was 25 miles from the bridge site, and the precast design of the bridge was inclusive enough to leave only 5% of the structural concrete for placement at the site.

• Pull-out bars for cable ducts—Provision for inserting prestressing cables was made in beam sections with bars to be pulled out of the concrete after it had set in the form. The bars, of smooth steel, were set in position in the upright beam form, and then concrete had been placed and vacuum mats applied with vibration. The form was stripped within an hour of the vacuum mat application, and the steel rods were drawn out, leaving holes in the hollow sections for the prestressing cables.

The bars have different positions from one section to the next in following the longitudinal axis of the cables. Every position of the bars in the section form had to be checked to assure the proper coincidence of holes when the sections were assembled on the site

Prestressing cables were then threaded through the holes in the longitudinal beams, and the joints between sections were sealed, using a fast setting cement. Tensioning of the cables each composed of eighteen 0.2-in. dia. wires, took place 24 hours after the joint between sections had been concreted. Cables were anchored but not grouted in until three months later in order to take up deformations in the concrete resulting from shrinkage and creep.

Dr. Fernado Piccinni of Ferrocemento, Rome, Italy, designed the bridge.



UPRIGHT FORM, 7 ft 2 in. high, was used to cast nine beam sections per day (950 in all). Note steel rods, with handles at top, used to form cable holes by extraction after vacuum process has set concrete.

Roof-heliport plan scrapped as a nuisance, not an aid

Because of objections by Belgian officials, plans for a heliport on top of a new air terminal building, now nearing completion in Brussels, have been abandoned. Noise that would be caused by the roof-top heliport operation was cited in the views of city officials. In the central district where the terminal stands even the street cars are being put under ground, partly because of the presence of the national cathedral which is used for important civic ceremonies.

Civil aviation authorities objected to the heliport on the ground of safety. The terminal building heliport would provide an approach over roof tops and streets, and any faulty operation of a helicopter might result in disaster.

Airline officials themselves were afraid that the helicopter service would soon outgrow the roof of the new terminal. The roof would be too small to allow any waiting of helicopters. The original plan had been devised to give fast service connections for regular airline flights, from outlying districts.

British firms combine to bid on St. Lawrence seaway

Ten of England's largest construction companies have formed a group for bidding on the St. Lawrence Seaway project due to get under way some time next year. The combine is called the St. Lawrence Waterways Group and is headed by Sir Albert Braithwaite. Member firms are: Caffin & Co., Dorman Long, Richard Costain, Matthew Hall, John How

(*Continued on page 50*)

Unloads 21,494,000 pounds in 4 days

Tinker-to-Evers-to Chance, the famed triple threat big leaguers, never operated with greater teamwork in a put-out than the three floating cranes shown above.

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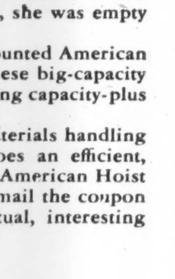

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ard, John Laing, Peter Lind, Sir Lindsay Parkinson, Taylor Woodrow, and George Wimpey & Co.

Peter Lind & Co. has already purchased two Canadian sand and gravel companies in the Toronto, Ont., area with an eye to supplying aggregate for the Seaway construction. Another of the member firms has recently incorporated a Canadian subsidiary for the development of an industrial estate.

To represent them on the Seaway project, the British combine has retained two former Canadian Department of Public Works officials who have formed the firm of Wilson & Partridge, Toronto, for this purpose.

International briefs . . .

• **New Zealand port development**—A $10-million expansion and construction program for the port of Wellington is envisaged by that city's Harbor Board. First stage of the plan will be the construction of a large concrete wharf.

• **Cuban hydro**—Engineering surveys have been completed for an $11-million hydroelectric program using the waters of the Hanabanilla, Negro, and Guanayara rivers in Las Villas Province, Cuba. The Hanabanilla project will be the first large hydro installation in Cuba. Knappen-Tippetts-Abbett-McCarthy, consulting engineers, New York, did the survey for the Cuban Bank for Agricultural and Industrial Development.

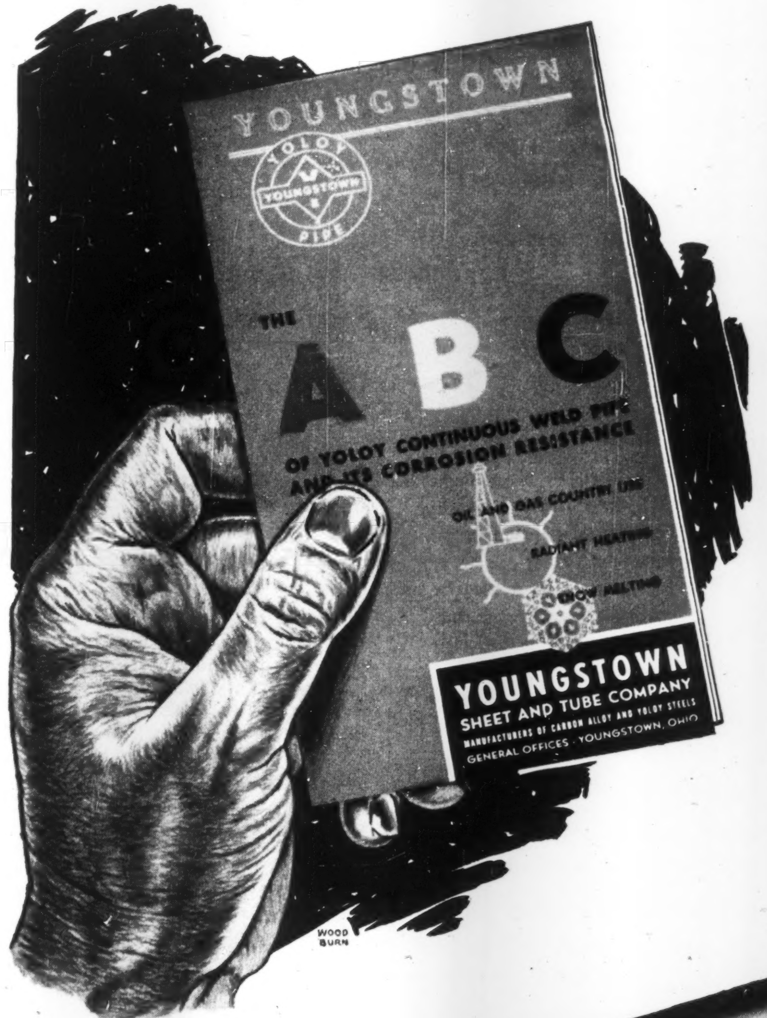
• **Sewage plants in Brazil**—Construction plans for six large sewage treatment plants have been presented to the governor of Sao Paulo. Planned for the central city, Sao Paulo, and its surrounding districts, the $25-million treatment system was designed by Greeley & Hanson, engineers, of Chicago. The six stations are to be at Vila Leopoldina, Pinheiros, Casa Verde, Penha, Santa Amaro, and Sao Caetano.

• **Canadian refinery**—Standard Oil of British Columbia has awarded a $10-million contract to Fluor Ltd., Montreal, a subsidiary of Fluor Corp., Los Angeles, for the construction of an oil refinery at Burnaby, B. C.

• **Trans-Central American highway**—El Salvador has proposed to Honduras that a $10-million highway be built from Puerto Cortes, Honduras, on the Caribbean Sea, to connect with El Salvador's highways to its Pacific Coast ports. El Salvador would pay

(*Continued on page 52*)

This DATA may solve YOUR piping problem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• **Toronto port works**—Contract for the construction of a 2,200-ft wharf, which will provide 11 new berths for the port of Toronto, on Lake Ontario, has been awarded to Sir Robert Thomas McAlpine & Sons, Ltd., Toronto. The $1.4-million award is part of the overall St. Lawrence Seaway Development.

• **Cairo hotel**—A $6-million hotel to replace famed Shepheards (destroyed by fire in 1952) is to be built in Cairo by Hilton Hotels International Inc. Architect for the 10-story structure is Welton Becket & Associates of Los Angeles, Calif.

• **Caracas subway**—Morrison-Knudsen Inc. is studying possibilities for construction of a subway to relieve traffic congestion in downtown Caracas.

• **Industrial development**—in Auckland, New Zealand, the Tasam Pulp & Paper Co. plans an integrated $80-million development which includes a newsprint mill, pulp mill, railroad, hydroelectric project, and a complete town near Auckland. Technical assistance for the plan will be provided by the Abitbi Power & Paper Co., Toronto, Ont.

• **Salvador electrification**—CAESS, a Canadian owned power company which will distribute power generated by El Salvador's new Lempa River hydro plant (ENR December 3, 1953 p.51), plans to spend $4-million in the next four years in revamping and improving its distribution system in that country.

• **Plastic pipe in France**—The Societe des Fonderies de Pont-a-Mousson, Nancy, France, has signed a contract to produce glass fiber reinforced plastic pipe under license from the Reflin Co., Los Angeles, Calif. Pont-a-Mousson will manufacture pipe in France, Belgium, Germany, the Saar, Spain, and Cuba.

• **Lebanese radio station**—In its 1954 budget the Lebanese government has decided to allocate $1.3 million for a broadcasting station. Construction of the station, to compare rival the biggest in the world, will be open to foreign companies when bids are asked next year.

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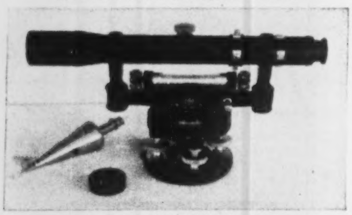

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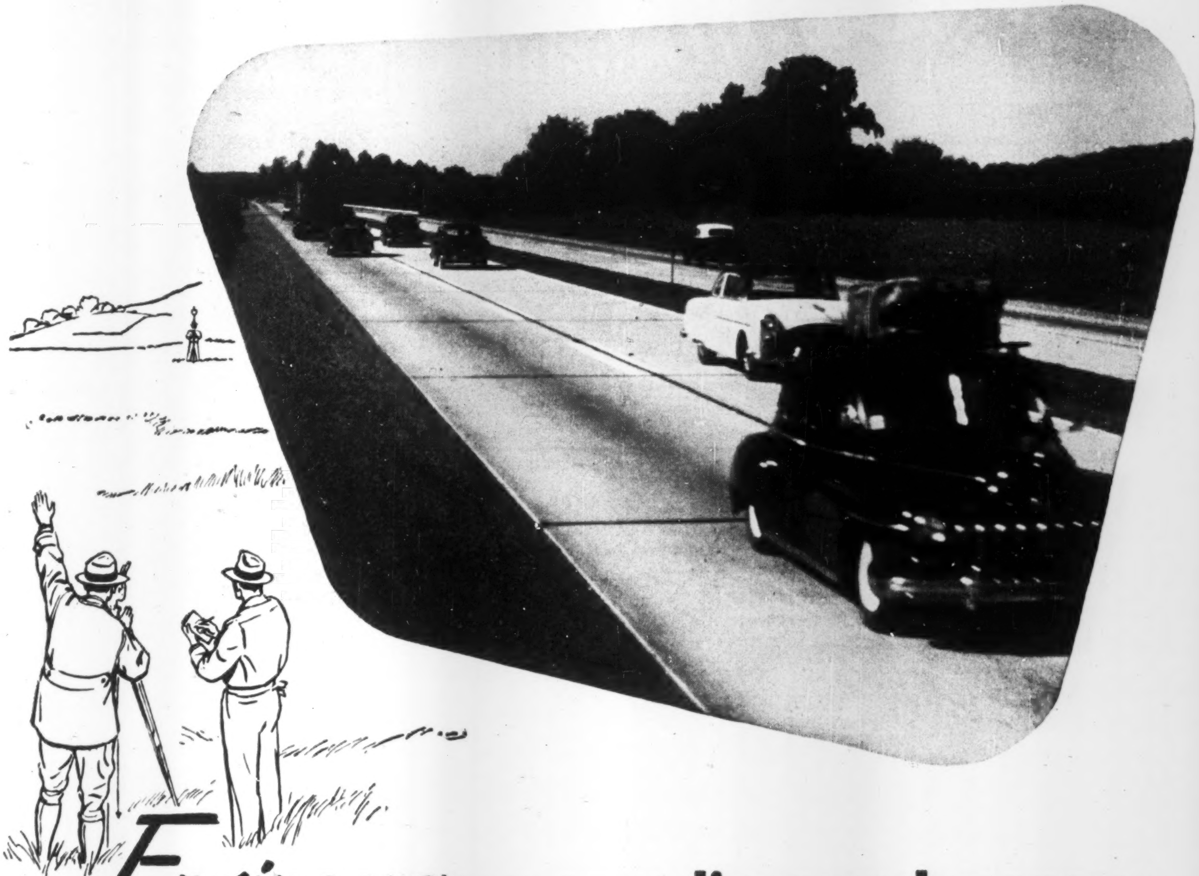

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Concrete is free from hazardous ruts, washboard ripples and raveled edges.

All these safety features of concrete pavement help reduce the tragic toll of highway accidents.

Concrete is moderate in first cost yet can be designed accurately for any axle load—and will *keep* that load-carrying capacity throughout its life.

Concrete has the lowest maintenance cost, according to official state highway department records.

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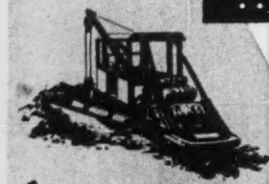

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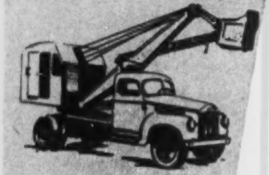

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MEN AND JOBS

Pool of knowledge formed

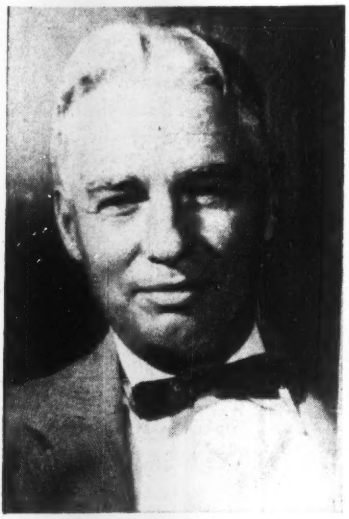
Eighteen retired professors at the University of Washington—including former deans or high-ranking professors in chemical, electrical, hydraulic and mineral engineering—have formed a consultant service known as the Retired Staff Assn.

Members of the group have offered their services to business, industry, government and education in a four-page brochure listing their talents. They include Henry K. Benson, chemical engineering; Edgar A. Loew and Gordon R. Shuck, electrical engineering; Charles E. Weaver, geology; Charles W. Harris, hydraulic engineering, and Milnor Roberts, mineral engineering.

Service switches

Capt. Archibald D. Hunter, former deputy chief of the Bureau of Yards and Docks, will take over as commanding officer of the naval construction battalion center at Davisville, R. I., in January.

Fred S. Poorman, former deputy chief of engineering for military construction in the Office of the Chief of Engineers, has taken a new post in



T. CORTLANDT WILLIAMS is the new executive vice-president of Stone & Webster Corp., New York and Boston. He will continue his present job as senior construction manager—but also will be responsible for direction and coordination of the firm's activities in Boston.

the Department of Defense as head of the technical division and senior assistant to Rear Adm. Joseph F. Jelley, director of construction.

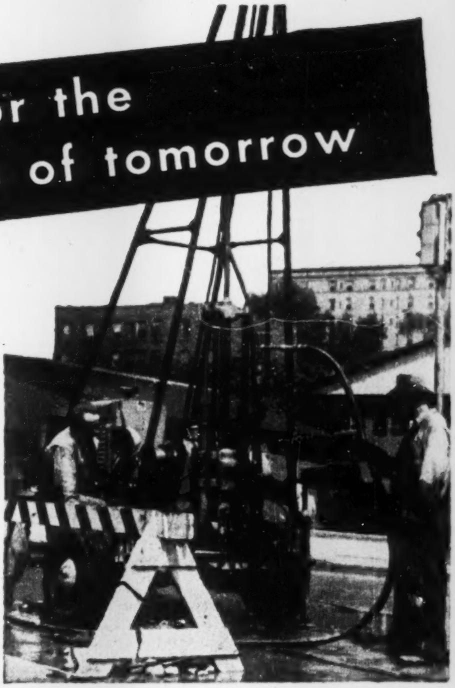
Career briefs . . .

- **Head highway engineer**–Ralph R. Bartelsmeyer has been appointed chief highway engineer for the Illinois state highway department, succeeding Frank Barker who resigned to work for the Santa Fe Railroad. Superintendent of highways for St. Clair County, Ill., since 1948, Bartelsmeyer has also been a junior engineer for the Illinois highway department, highway superintendent for Washington County, Ill., and field engineer for a Chicago cement maker.

- **Engineer Corps change**–Lt. Col. Sidney Shelley has been named Honolulu Area Engineer for the San Francisco district, Corps of Engineers. He succeeds Lt. Col. D. M. Matheson

(Continued on page 56)

NEW DEPUTY CHIEF of the Bureau of Yards and Docks, Capt. Joseph A. McHenry, has been stationed for the last year in Philadelphia as district public works officer, 4th Naval District. Before the Navy called him up in 1941, he had 13 years engineering work behind him: with the Pennsylvania Department of Highways; United Engineers and Constructors; the Electric Power Equipment Co. of Philadelphia, and the construction division of the Quartermaster Corps. Early in the war he was officer in charge of outfitting new construction battalions. Later he was transferred to the Philippine Islands, where he was cited for work with the Seabees.



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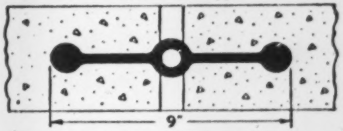

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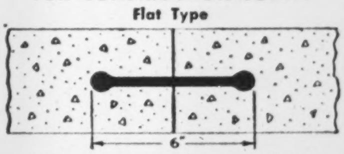

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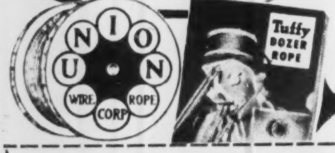

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who has been assigned to the office of the Chief of Engineers as head of the historical division, with headquarters in Baltimore.

- **Road group officers**—Earle V. Miller, Idaho state highway engineer, has been elected president of the Western Assn. of State Highway Officials. Other new officers are: vice-president, C. O. Erwin, New Mexico state highway engineer; secretary, W. E. Willey, Arizona economics and statistics engineer. Named to the executive committee are D. C. Greer of the Texas highway department; W. A. Bugge, Washington director of highways and W. C. Williams, assistant Oregon highway engineer.

- **Cleveland's choice**—James Yeilding has been appointed urban redevelopment director for Cleveland. He has been on the mayor's advisory committee for urban redevelopment and—for the last eight years—has been with the Cleveland Electric Illuminating Co. area development department.

- **Federal appointments** — Commissioner W. A. Dexheimer has announced two new appointments in the Bureau of Reclamation. S. W. Crosthwait, formerly director of supply, will be acting assistant commissioner for administrative activities. Clyde H. Spencer, who has been supervising engineer of the California Projects office, will be director of the reestablished Region Two with headquarters at Sacramento, Calif.

- **Corbetta names directors**—Corbetta Construction Co., Inc., general contractors of New York and Chicago, has increased the number of its directors from three to eight. Roger H. Corbetta will continue as president and chairman of the board. Other board members are: Miss Thelma Weiss, Charles J. Prokop, Francis A. Vitolo and Louis J. Corbetta (all members of the firm); Robert C. Vincent, attorney with the law firm of Wilkie, Owen, Farr, Gallagher and Walton; George Freedman, accountant, of the firm of Glick and Freedman, and T. Craig Carle, of Carle and Carle, insurance brokers.

- **Engineering award made**—Morton O. Withey, emeritus dean of the University of Wisconsin college of engineering, has been awarded the citation of merit of the Wisconsin Utilities Assn. He was cited for outstanding service to the state, the university and the engineering profession for almost half a century.

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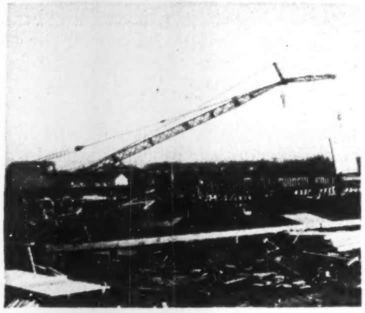

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OBITUARIES

Duncan McEvoy Campbell, 58, chief engineer of the Cook County, Ill., Highway Department since 1939, died Nov. 24 in Chicago. He was graduated from the University of Illinois in 1917 with a B.S. of C.E. degree, and has been with the department for 36 years except for service in the armed forces during World War I.

Ray B. Scofield, a civil engineer with the New York State Highway Department, died Nov. 25 in Albany.

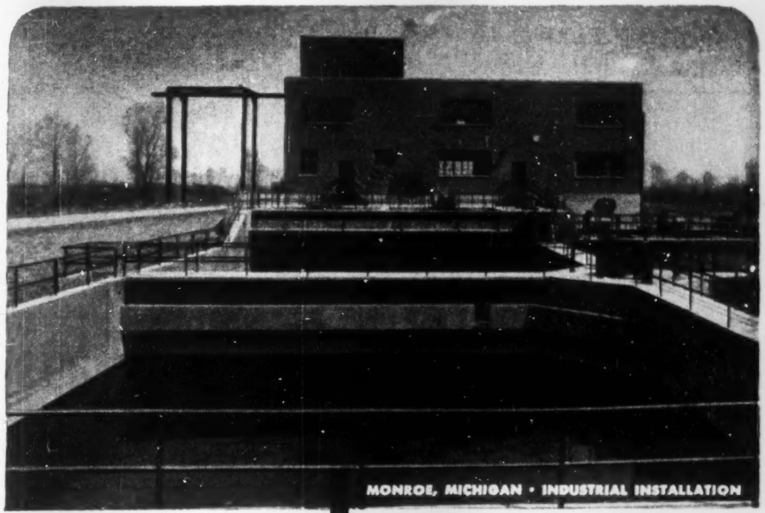
Elmer A. Nelson, 52, a civil engineer with the Air Force, died at Takoma Park, Md., Nov. 25. He was a graduate of the University of Minnesota and formerly worked with firm in Chicago and Pittsburgh.

Frank Egan, 58, an engineer with the New York State Department of Public Works, died at his home in Syracuse Nov. 28. He was a 1917 graduate of Syracuse University. For 35 years he had been an assistant engineer of maintenance with the Syracuse district of the State D.P.W.

Dean H. Watkeys, 68, of Syracuse, N. Y., civil engineer, died Nov. 26. A graduate of Syracuse University, he was senior engineer for the Onondaga County Clerk's Office, where he had been employed eight years. Before that, he had been in business for himself as a civil engineer. He worked in connection with surveys of the Baldwinsville Army Ordnance depot and the Mattydale Air Base.

Otis Van De Mark, 66, vice-president of the American Construction Co., died Nov. 24 at Houston, Tex. He was with the firm for 40 years, retired from active work in 1950, but continued as vice-president. He was also president of the Powers Plastering Co. During the time he was with the American Construction Co. the contractors built the Rusk Building, the Gulf Building, Niels Esperson and Mellie Esperson Building. He was a Cornell University C.E. graduate.

Russell David Rogers, 61, former senior civil and architectural engineer with the E. I. du Pont de Nemours and Co., died Nov. 30 in Miami, Fla. He was a former president of the National Society of Professional Engineers. He drew up the original building code for Wilmington, Del. He was honored by the federal government for his work on the atomic bomb during World War II.



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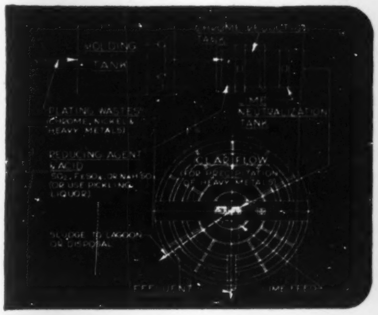
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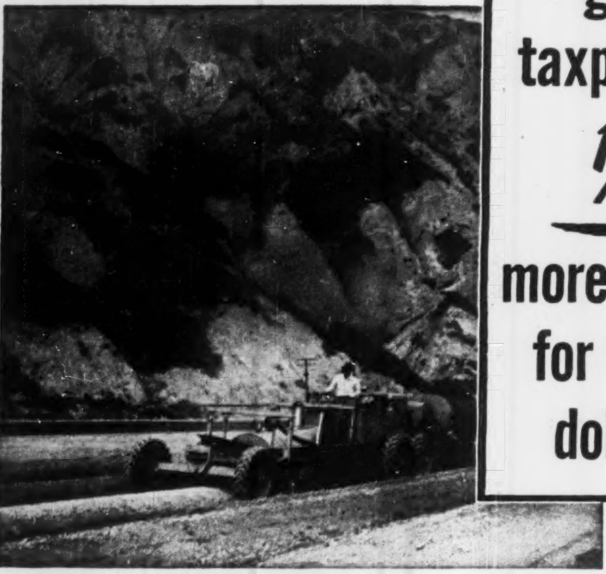

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BOOKS

Design of cities

Town Design—By Frederick Gibberd. 300 pp. Reinhold Publishing Corp., 330 W. 42nd St., New York 36, N. Y. $15.00

This book affords an opportunity for one of England's foremost architects to "preach what he practices." Its purpose is to integrate the conventional piece-meal treatment of architecture, landscape and road design—usually presented individually—giving each its relative position within the pattern of "the Urban Scene."

Over 700 plans, diagrams and photographs have been employed in two unique mediums of visual presentation. Relationships between the plan view and the photograph are deftly tied in by locating the camera on a plan-view sketch of the area photographed. Arrangements of buildings are clearly illustrated through very competent use of perspective and isometric sketches.

The first of the four parts of this book deals with the design of the complete town and its development for the achievement of maximum functionality without loss of aesthetic appeal. The others are given over to detailed treatments of the design of central area, selection of sites for industry, and housing.

Miscellaneous notes

- **A Water Measurement Manual** has just been issued by the Bureau of Reclamation to supersede "Measurement of Irrigation Water", which appeared in five editions between 1913 and 1940. It brings together in convenient form data needed by the operators of irrigation works and engineers who design measuring devices or structures. Copies may be obtained from the Field Supply Division, Bureau of Reclamation, 841 Denver Federal Center, Denver, Colo., or from the Superintendent of Documents, Washington 25, D. C. Price of manual is $1.50.

- **Industrial utility of public water supplies** in the New England States, 1952, is the subject of Geological Survey Circular 288. This report (last in a series of nine covering all sections of the country) contains water data on 103 of the larger New England cities, towns and villages. It includes information on ownership, sources and treatment of water supplies; storage facilities of both raw and finished water; chemical analyses of water;

population and population supplied. With industry in the U. S. using over 81 billion gpd of water (1950), this survey was made as an aid to industries seeking new plant sites. Circular 288 may be obtained free from the Geological Survey, Washington 25, D. C.

New engineering books

Billings and Water Power in Brazil, a short Biography of Asa White Kenny Billings—By Adolph J. Ackerman. 129 pp. Published jointly by the author and the American Society of Civil Engineers, and obtainable from the society, 33 West 39th St., New York 18, N. Y. $7.00

Centennial Transactions of the American Society of Civil Engineers—Edited by Sidney Wilmot. 1,330 pp. Published by the society at 33 West 39th St., New York 18, N. Y. Price, paper, $3.00, cloth, $4.00

Famous Bridges of the World—By David B. Steinman. 99 pp. Random House, New York. $1.75

Climate & Architecture—By Jeffrey Ellis Aronin. 304 pp. Reinhold Publishing Corp., 330 West 42nd Street, New York 36, N. Y. $12.50.

Reports and pamphlets

Weld Standards—Form 820, The Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio. $1.00.

The Application of Clay Products in Warm Climates—The Clay Products Association of the Southwest, 109 Perry-Brooks Building, Austin, Tex.

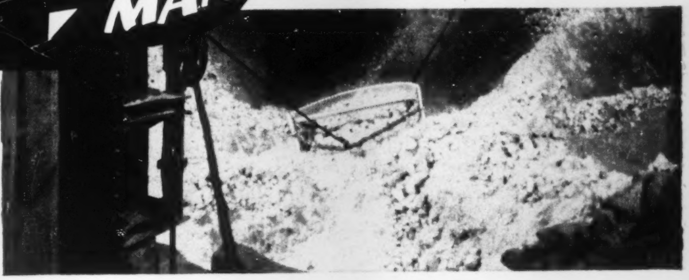
Feasibility of Toll Roads in Washington—Background for Enabling Legislation—Washington State Council for Highway Research, University of Washington, Seattle 5, Wash.

Study of Finite Boundary Roughness in Rectangular Flumes—Technical Memorandum No. 2-364, Waterways Experiment Station, Vicksburg, Miss. $1.00.

Wasted: $3 Billions Yearly—We Can't Afford It—A Positive Program of Highway Building. Automobile Manufacturers Association, New Center Building, Detroit, Michigan.

Slate Roofs—National Slate Association, 455 West 23rd St., New York 11, N. Y. $1.50.

Measurement of Air Pollution—Industrial Hygiene Foundation, 4400 Fifth Ave., Pittsburgh 13, Pa.



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FR-217 Sugar Storage
FR-218 Handling Fertilizer Material
FR-221 Storing Sand and Gravel
FR-223 Unloading Systems for Ships and Barges
FR-224 Handling Ore with Drag Scrapers
FR-201 Stockpiling 300,000 Tons of Coal
FR-215 Small Area Coal Storage

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TAUTLINE HANDLES QUARRY STONE
118-foot derrick head mast with 80-foot wooden tail mast allows load to coast down to discharge point. EFR 106.

DIGGING GRAVEL FROM A RIVER
Slackline cableway digs aggregate from a river bar over a 700-ft. span, conveying and automatically dumping into hopper. Lateral shifting of the cableway permits working material at all times. EFR 102.

SEGREGATED ORE STORAGE
Separate grades of ore are stockpiled by scrapers and arranged for dual operation on one pile or with each machine working a separate pile. EFR 104.

STOCKPILING 300,000 TONS OF COAL
Storing and reclaiming is handled by a 10-cu. yd. scraper machine at a large utility. EFR 201.

SIZED SAND AND GRAVEL
Five sizes are stockpiled by five scrapers. Storage piles also serve as ramps for truck loading. One man operation of entire system. EFR 221.

WET CLAY HANDLING
1-cu. yd. Crescent Scraper digs clay for a cement plant. Fifty tons per hour are discharged into an elevated truck hopper. EFR 204.

RECLAIMING INDUSTRIAL WASTE
Two million tons of coal silt are being reclaimed by rapid-shifting scraper. It is processed into fuel for two generating stations. EFR 212.

BULK SUGAR STORAGE
Specially designed scraper buckets cut cost of handling sugar in warehouses and unloading ships. EFR 217.

SAUERMAN NEWS
Removing river bars, excavating under a building, paving under Mississippi, scraper equipped self-unloader boats. SND 137.

REQUEST BY NUMBER—SAUERMAN BROS., INC., 532 South Clinton Street, Chicago 7, Illinois

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WiNISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

LOW BIDS AND CONTRACTS

▲† **Me., Limestone**—PARKING APRON—B.A. About 4/1 U. S. Eng., 857 Commonwealth Ave., Boston, Zone 15, Mass., parking apron, taxiway exten., warm-up pad and maintenance hangar apron; exterior utilities for parking apron, taxiway exten., maintenance hangar apron, water, sewer and electrical; storm drains, subdrains, toe drains, in connection with pavement work, refueling sys. incl. steel gasoline lines, and sleeves, relocation 3 control pits, installing 3 fueling hydrants, Limestone Air Force Base, ENG-19-016-54-72. $5,000,000. Plans deposit $25. CD 9/19/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

J. F. White Constr. Co., 201 Alewife Brook Parkway, Cambridge, Mass. LB. **$3,822,419**, est. $3,000,000. hy. and bridge constr. F.A. Proj. F 344 (3), Brockton and West Bridgewater;

G. Rotundi & Sons, 2 Washington St., Melrose, Mass. LB **$2,637,832**, est. $2,400,000. hy. and bridge constr., Billerica and Chelmsford. Bids Dec. 1. CD 11/5 and 11/18.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P Wks., 100 Nashua St., Boston,

Farina Bros., 429 Watertown St., Newton, Mass. LB **$3,168,518**, est. $2,970,000. Constr. 1 railroad grade crossing elimination Lincoln Square, Worcester. Bids Dec. 4. CD 11/30.

BUILDINGS

LOW BIDS AND CONTRACTS

Charles Logue Building Co., 71 Needham St., Newton, Highlands, Mass. CA **$627,044**, est. $578,218. Elementary SCHOOL Dean A. Luce, CANTON, MASS. Town, Permanent School Bldg. Comn., Lee W. Court, chn. School Dpt., High School, Canton, Mass. CD 11/17.

▲ **Park Constr. Co. Inc.**, 40 Court St., Boston, Mass. LB **$1,114,000**, est. $1,000,000. Junior High SCHOOL, MARBLEHEAD, MASS. Town, Town Hall, Marblehead, Mass. Bids Dec. 2. CD 11/20.

▲ **George B. H. Macomber Co.**, 19 Milk St., Boston, Mass. CA **$1,000,000**, 2 story, bsmt., brick, steel, concrete Chemistry LABORATORY and CLASSROOM BLDG., Park St., SOUTH HADLEY, MASS. Mount Holyoke College, Roswell Gray Ham, pres., South Hadley, Mass. CD 11/27.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

N. Y., New York—FERRY TERMINAL BLDGS.—B.A. 12/21—Comr. Marine & Aviation, Pier 1, North River, Zone 4, Contr. 2879, foundations and incid. work, rehabilitation of Whitehall-South Street Ferry Terminal Bldgs., Manhattan Boro. Plans deposit $10. CD 8/17/45.

New York—ABUTMENTS ALTERATIONS—B.A. 12/22—At office Chief Engineer of The Port of New York Auth., 111 8th Ave., New York, Zone 11, Contr. LT-110.001, alterations to abutments on Dyer Ave., approaches to Lincoln Tunnel. Plans deposit $25. CD 3/12/51.

New York—GRADE CROSSING ELIMINATION—B.A. 12/22—New York City Transit Auth., 370 Jay St., Brooklyn, Zone 1, constr. grade crossing elimination for Wye connection at Hammell, Queens Boro. (Rte. 119-G, Rockaway). CD 8/31/45.

BIDS ASKED—BUILDINGS

▲ **N. Y., New York**—HOSPITAL—B.A. 12/23—Hospital for Joint Diseases, 1919 Madison Ave., Zone 35, hospital alterations, 41-43 E. 123 St., $500,000; hospital clinic alterations, 45-61 E. 123 St., $600,000. Charles B. Meyers Assoc., 31 Union Square, Zone 3, archts. CD 8/28.

HEAVY CONSTRUCTION

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

Berlanti Constr. Co., Inc., 15 Oakland Ave., Harrison, N. Y., LB **$1,647,223**, est. $1,667,000. elimination of grade crossing of New York Central R.R. and Mt. Kisco Vill: Main St., S. H. 865, South St. and Hubbels Crossing, 1.7 mi. PSC 4678-5777, Westchester Co.;

Raylin Constr. Corp. & The Lynn Corp., 11 W. 42 St., New York 36, N. Y., LB **$3,119,288**, est. $3,309,000, New York State Thruway-Hudson Sect. Subd. 10 (Tuckahoe Rd.-Tarrytown, Pt. 2); access ramps; Mountain Rd., 0.73 mi. acc., 0.42 mi. Thy., H.T 53-13, S.T. 53-35, Westchester Co. Bids Dec. 3. CD 11/11.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

DelBalso Constr. Corp., 500 Zerega Ave., New York, N. Y LB **$7,162,902**, est. $7,721,000, New York State Thruway-Hudson Sect.-Subd. 9A (Nyack Approach to Tappan Zee Bridge); Nyack Interchange; access ramps; New Jersey State line-Nyack Pts. 3 and 4, S.H. 8136-5682; Nyack Village: Main St. S.H. 8459; Knapps Cors.-Nyack, S.H. 5178 and Nine misc. secondary cross roads, incl. relocation of R.R. tracks, 4.46 mi. Acc., 1.57 mi. Thy. H.T. 53-10, R.C. 53-121, S.T. 53-33, Rockland Co.;

Klevens Corp., Federal St., Yonkers, N. Y., LB **$2,515,356**, est. $2,850,000. New York State Thruway-Hudson Sect. Sub. 8, (Suffern-Nyack Pt. 1), 0.21 mi. H.T. 53-12, Rockland Co. Bids Dec. 3. CD 11/11.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

Collins Bros., Waterford Rd., Mechanicville, N. Y. LB **$70,398**, est. $86,000, 0.39 mi. Cambridge-Salem Pt. 2, S. H. 5293, FARC. 53-130, Washington Co.;

Peter Mitchell, Inc., Hackett Bldg., Greenwich, Conn. LB **$1,598,129**, est **$1,605,000**, 5.72 mi. New York City, Bd. of Water Supply Rd. No. 3 (Pepacton Reservoir) and Roads Nos. 2, 4, 3A, 3B, 3C, 3CT. 53BWS 2-3-3A, 3B-3C-3CT-4, Delaware Co. Bids Dec. 3. CD 11/11.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,

John F. Casey Co., P.O. Box 1888, Pittsburgh, Pa. CA **$1,570,958**, constr. two main piers Fort Pitt Bridge, 8 bents for part of approach, rein.-con. retaining wall and survey tower, Penn-Lincoln Parkway over Monongahela River, Allegheny Co. Bids Nov. 19, awarded Dec. 2. CD 11/24, under LB.

▲ **PENNSYLVANIA**—State Hy. & Bridge Auth., 506 N. Office Bldg., Harrisburg,

Buckley & Co., Inc., 1317-21 S. Juniper St., Phila., Pa. CA **$1,499,963**, constr. 1,407 ft. hy., divided, plain c. conc. base course with bit. surf., 2 steel I-beam and girder bridges, Pennsylvania Blvd., Phila. Co. Bids Nov. 20, awarded Dec. 2. CD 11/24, under LB.

▲ **Pennsylvania**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,

H. R. Miller Co., Inc., Box 1235, Lancaster, Pa. CA **$2,018,685**, constr. 33,160 ft. divided road of rein.-con. pavement, 2 lanes each 20 ft. wide, 20 ft. earth divisor, T.R. 22, Berks Co.;

Central Pennsylvania Quarry, Stripping & Constr. Co., P.O. Box 378, Hazleton, Pa., CA **$3,581,477**, constr. 19,414 ft. divided road with crushed aggregate base and bit. surf. variable in width, three deck girder bridges and an I-beam bridge, T. R. 100. Chester and Montgomery Counties;

Fred W. Ewing, Inc., 405 W. Main St., Corry, Pa., CA **$1,857,152**, widening and overlay 49,345 ft. road with crushed aggregate base and bit. surf. variable in width, one I-beam and six rein.-con. bridges, T.R. U. S. 20, Erie Co. Grand total $7,457,314. Bids Nov. 19, awarded Dec. 2. CD 11/24, under LB.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Ocean Farragut Corp.**, 550 Flatbush Ave., Brooklyn 25, N. Y. Separate Contracts. **$1,000,000**. 6 story APARTMENT, 1111-45 Ocean Ave., BROOKLYN, N. Y. CD 6/24.

▲ **John A. Johnson & Sons, Inc.**, 303 41 St., Brooklyn 32, N. Y., CA **$2,443,000**, general constr. and foundation;

Harry Starkman & Bros., 348 Brook Ave., New York 54, N. Y., CA **$341,345**, heating and ventilating for LaGuardia HOUSES, Proj. No. NY 5-21, Sect. I, incl. Bldgs. 4, 5, 7 and 9 in areas in Manhattan Boro, in block bounded by Montgomery, Monroe, Clinton and Madison Sts., Bldg. 5 in easterly half of block bounded by Madison, Clinton, Monroe and Jefferson Sts. and Bldg. 4 in easterly half of block bounded by Monroe, Clinton, Cherry and Jefferson St., NEW YORK, N. Y. New York City Housing Auth., 63 Park Row, New York 38, N. Y. Bids Dec. 1. CD 11/16.

▲ **C.W.C. Constr. Corp.**, 105 Court St., Brooklyn 2, N. Y. LB **$1,223,500**, general constr. P.S. 198 SCHOOL, Avenue D, E. 11, Dry Dock and E. 12 Sts., Manhattan Boro, NEW YORK, N. Y. Director Bureau Constr., 49 Flatbush Ave. exten., Brooklyn 2, N. Y. Bids Dec. 2. CD 11/10.

Joseph Portman, 3525 Jerome Ave., New York, N. Y. Separate Contracts, **$630,000**. 6 story APARTMENT, 1067-71 Madison Ave., NEW YORK, N. Y. CD 9/3.

Halsag Realty Corp., 90 E. 158 St., New York, N. Y Separate Contracts, **$650,000**. 6 story APARTMENT, 181 St. and Anthony Ave., NEW YORK, N. Y. CD 9/14.

▲ **Sylvester A. Lowery**, 1716 Cheltenham Ave., Phila., Pa., and **E. J. Frankle**, Bankers Security Bldg., Phila., Pa., Owner Builds, **$30,000,000** PARK CITY APARTMENT, in Delaware Twp., near ELLISBURG, N. J. J. Raymond Knopf & S. I. Oshiver, 1704 Walnut St., Phila., Pa., archts.

C. DeChicchis & Co., Clairton, Pa., CA **$645,458**, general constr. Elementary-Secondary SCHOOL for the Commodore Perry Joint Area School Dist., MERCER, PA. State Public School Building Auth., 101 S. 25 St., Harrisburg, Pa. Bids Dec. 3. CD 11/5.

▲ **Kahn Engineering Co.**, 427 O St., S.E., Wash., D. C. LB, **$1,123,044**. North Bethesda Junior High SCHOOL, Bethesda, ROCKVILLE, MD. Montgomery Co. Bd. Educ., Rockville, Md. Bids Dec. 3. D 11/9.

SOUTH

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **T. L. James & Co.**, Drawer 8, Kenner, La. LB **$3,838,580**. constr. Veterans Memorial Hy., GRETNA, LA. Jefferson Parish Police Jury, Rd. Dist. No. 1, Gretna, La. Bids Nov. 30. CD 11/2.

MIDDLE WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,

E. K. Bridge Constr. Co., 2416 Byrne Rd., Toledo, O. CA **$798,964**, est. 825,650, **Part No. 1**, c. conc. paving, constr. continuous steel beam bridge with concrete deck and substructure, **Bridge No.** WO-120-08 over Toledo Expressway, St. **Rte.** 120 (R); Part No. 2, c. conc. paving, constr. continuous steel beam bridge with concrete deck and substructure, Bridge No. WO-120(R)-84 carrying Wales Rd. over Toledo Expressway (St. Rt. No. 120) (R), 0.231 mi. S. R. 120 (R), Sect. 8.25; S. R. 120, Sect. 0.66 (Part No. 6-Toledo Expressway System), UI-399 (5), UI-1052 (7), FI-1052 (8), Parts Nos. 1 and 2, Wood Co.;

B. & G. Bituminous Co., Box 538, Sidney, O., CA, **$556,763**, est. $567,900, wid'n., paving, b. conc. resurf. and constr. continuous concrete slab bridge with capped pile abutments and piers, Bridge No. SH-25-106 over Finkenbine Ditch; concrete beam exten. to an existing concrete beam bridge, Bridge No. SH-25-171 over Fridley Creek and steel beam with concrete deck extens. to an existing steel beam bridge, Bridge No. SH-25-183 over Loramie Creek, 11.139 mi. U. S. R. 25, Sects. (8.28-13.99), (14.51) (19.57), Shelby Co. CD 12/2, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Faxon Realty Co.**, 3601 Bellecrest St., Cincinnati, O. Owner Builds. **$1,050,000.** 73 one-family 1½ story, 25x33 ft. HOMES, DEER PA[illegible], [illegible] Nunlist & Frolicher, Trac Bldg., Cincinnati, O., engrs. Awarded Dec. 2.

▲ **Geo. Sollitt Constr. Co.**, 109 N. Dearborn St., Chicago 2, Ill., LB, **$1,854,416**, two 9 story, APARTMENT bldgs. on campus, CHICAGO, ILL. Illinois Institute of Technology, 35 W. 33 St., Chicago, Ill. Bids Nov. 30. CD 11/2.

▲ **Rust Furnace Co.**, 575 Sixth Ave., Pittsburgh, Pa. CA Total cost **$100,000,000**. design and construct slab heating furnace and 5 batteries of soaking pits for hot strip MILL, TRENTON, MICH. McLouth Steel Corp., 300 S. Livernois St., Detroit, Mich. CD 5/28.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲† **N. M., Roswell**—PAVING—B.A. 12/29—U. S. Eng., Box 1538, Albuquerque, addnl. 50,000-60,000 sq. yd. 20 in. rein.-con. paving, Walker Air Force Base, Serial No. Eng-29-005-54-50. $1,385,000 CD 8/28/51.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Erie Mining Co.** (Bethlehem Steel Corp., Youngstown Sheet & Tube Co., Interlake Iron Corp., The Steel Co of Canada), c/o Pickands, Mather & Co., Union Commercial Bldg., Cleveland, O., design and construct TACONITE DEVELOPMENT, AURORA, MINN. Project includes ore processing plant, housing for workers, 73 mi. railroad, complete harbor at Two Islands, on Lake Superior, with docks, generating plant, to **Anaconda Copper Mining Co., Engineering Div.**, 25 Broadway, New York, N. Y. Total estimated cost **$300,000,000**. CD 4/25/52.

▲ **Gamble Constr. Co.**, 804 Pine St., St. Louis 1, Mo. LB **$2,587,000**, general contract;
Peters-Eichler Heating Co., 1516 Pine St., St. Louis 3, Mo. LB **$412,892**, heating and ventilating contracts;
S. C. Sachs Co., Inc., 5540 West Park Ave., St. Louis, Mo. LB **$627,500**. electrical contract for rein.-con., brick, steel, stone technical HIGH SCHOOL, 5101 Northrup Ave., vicinity of McRee and Hereford Aves., ST. LOUIS, MO. Bd. Educ., c/o V. Harry Rhodes, comr. School Bldgs., 911 Locust St., St. Louis 1, Mo. Bids Dec. 1. CD 11/2.

▲ **Ebasco Services, Inc.**, 2 Rector St., New York, N. Y. CA **$20,000,000**. design and construct Sam Bertron Steam ELECTRIC STATION, HOUSTON, TEX. Houston Lighting & Power Co., 900 Fannin St., Houston 2, Tex. CD 8/19.

FAR WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Fred J. Early Jr. Co., Inc.**, Box 114, Torrance, and **Stolte, Inc.**, 8451 San Leandro St., Oakland, Calif., LB, **$2,977,000**, runways and taxiways airfield lighting, grading and drainage, PALMDALE, CALIF. Lockheed Aircraft Corp., Box 551, Burbank, Calif. Bids Dec. 1. CD 12/2.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Zoss Constr. Co.**, 1037 N. Cole Ave., Los Angeles, Calif., LB, **$1,951,916**, Pacomia Junior High SCHOOL, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Dec. 2. CD 11/6.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ont., London**—Y.M.C.A. ADDN.—B.A. 1/21—O. Roy Moore, assoc. archt., 260½ Dundas St., 5 story, brick, steel Y.M.C.A. bldg. and remodelling part of old bldg., for London Y.M.C.A. and Y.W.C.A., 420 Wellington St., London, Ont. $1,150,000. S Nock, Y.M.C.A. Building, 291 Broadway, New York, N. Y., archt. CD 6/5/52.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Milne & Nicholls Ltd.** 57 Bloor St. W., Toronto, Ont., LB, **$1,318,337**, Regent Park HOUSING BLDGS. 20, 28 and 29, apartment blocks, TORONTO, ONT. Housing Auth. of City of Toronto, City Hall, Toronto, Ont. Bids Nov. 6. CD 10/22.

Proposed Projects

WATER SUPPLY

▲ **Tex., Corpus Christi**—City, City Hall, voted bonds sewage disposal plant units, **$1,500,000**; imprv. storm sewerage sys., **$500,000**; new storm sewers, **$1,500,000**; sanitary sewerage sys. rehabilitation, **$1,500,000**; new sanitary sewer collection lines, **$2,000,000**; sewer lift stations, **$300,000**. Sigler, Clark & Winston, Weslaco, consult. engrs. CD 11/13.

SEWERS, WASTE DISPOSAL

▲ **Fla., Miami**—City, City Hall, defeated bonds, storm sewer imprvs. **$2,500,000**. CD 10/27.

BRIEFS
from The YEOMANS GUARD

New Moderately Priced Bilge Pump Solves Many "Light-heavyweight" Problems

A new centrifugal wet pit drainage pump for capacities up to 120 g.p.m. and heads up to 46 feet has been developed to bridge the gap between the Yeomans "Drain-Dri" cellar drainer and the Yeomans Series 3000 Heavy Duty Bilge Pump.

The new model Series 3100 is designed for residential and business buildings, industrial and utility plants, sewage and water treatment plants, parks, pools and similar installations.

Advantageous features include heavy construction, higher heads at low capacity with less horse power, and engineering service on pump installation. Bulletin 3102 is available on request.

☐ Please send Bulletin 3102.

Pneumatic Ejectors— YEOMANS BUILDS A FULL LINE

Yeomans manufactures a full line of centrifugal pumps and pneumatic ejectors.

In each instance, Yeomans engineering attention focuses *on the character of job to be done*—

- to determine which type of pumping equipment will perform most efficiently, dependably, and at lowest cost.

This claim is, to be sure, common to practically all manufacturers; but here it has an added significance, because a Yeomans recommendation is wholly unbiased as to type of equipment.

In another respect, every Yeomans recommendation is emphatically biased—we have an uncompromising conviction that Yeomans Pumps, centrifugals, and pneumatics, are best built.

Moral: If you have a knotty problem of pumping material, talk to Yeomans.

Maintenance Brief

IT'S HEALTHY FOR SUCTION PIPING TO GET A GOOD SLANT ON

Here are two basic facts to remember about suction piping:

1. Horizontal piping should slope upward toward the pump.
2. Any reducer which connects between pump and pump intake nozzle should be horizontal at the top . . . eccentric, not concentric.

Like this:

Right way—
Up-sloping pipe and reducer horizontal at top prevent air-pocketing.

Wrong way—
Down-sloping pipe creates air-pocket.

Wrong way—
Tapered reducer not horizontal at top creates air-pocket.

An air pocket is bad news—the air may easily be sucked into the pump: causing loss of suction, which seriously endangers the pump.

Three good items to check:

☐ Check suction piping in present system—correct any down slope toward pump.

☐ Check here and mail to us for Centrifugal Pump Maintenance Manual 2000—a money-saver!

☐ Check here and mail to us for Manual 1112—has full information on Yeomans Centrifugals.

The Yeomans Guard, published several times a year, is a compendium of news and useful information covering the pumping of materials and the treatment of wastes, both domestic and industrial. We shall be pleased to send you the current issue if you'd care to have it. Ask your local Yeomans Representative—listed in the telephone book yellow pages under "Pumps"—or write direct.

YEOMANS BROTHERS COMPANY
1999-1 N. RUBY STREET, MELROSE PARK, ILLINOIS
Manufacturers of: Centrifugal Pumps and Pneumatic Ejectors for Buildings, Municipalities, and Industrial Applications, and a Full Line of Waste Treatment Equipment.

SOILS and FOUNDATION ENGINEERING

A Complete Soils Engineering Service Available to Architects, Consulting Engineers, Contractors, and Industrial Organizations

EXPLORATION DEPARTMENT

Test Borings in Soil or Rock—Undisturbed Soil Sampling a Specialty—Shelby Tube and Piston Samples up to 4½" Diameter — Penetration-resistance ("Split-spoon") Samples—Denison Core Barrel Samples — Displacement Samples—Probings—Test Pits —Load Tests—Pile Tests

SOIL TESTING LABORATORY

Triaxial Compression — Consolidation Unconfined Compression — Swell — Density — Permeability — Moisture Content — Specific Gravity — Liquid & Plastic Limits — Shrinkage — Sieve Analysis — Hydrometer Analysis — Compaction (AASHO and Modified) — CBR

ENGINEERING DEPARTMENT

Foundation Investigations for New Plant Sites — Construction Studies — Geological Investigations — Landslide Studies — Analyses of Foundation Failures — Design of Embankments and Earth Dams — Airfield Soil Investigations — Compaction Control — Ground Water Control — Special Soil Mechanics Studies

GREER & McCLELLAND

98 GREENWOOD AVE., MONTCLAIR, N. J.
2649 NORTH MAIN ST., HOUSTON, TEXAS

▲ **Tex., Corpus Christi**—City, City Hall, voted bonds sewage disposal plant units, **$1,500,000;** imprv. storm sewerage sys., **$500,000;** new storm sewers, **$1,500,000;** sanitary sewerage sys. rehabilitation, **$1,500,000;** new sanitary sewer collection lines, **$2,000,000;** sewer lift stations, **$300,000.** Sigler, Clark & Winston, Weslaco, consult. engrs. CD 11/13.

BRIDGES

▲ **Ill, Chicago—City, City Hall,**
Northwest Expressway, including
overpass at Lake St., **$570,000.**
overpass at Randolph St., **$565,000.**
overpass at Washington Blvd., **$570,000.**
overpass at Madison St., **$560,000.**
overpass at Monroe St., **$565,000.**
overpass at Adams St., **$560,000.**
overpass at Jackson Blvd., **$560,000.**
overpass at Van Buren St., **$565,000.**
railroad grade separation from Kinzie St. to Hubbell St. **$2,000,000.**
railroad grade separation from Wayman Ave. to Kinzie St. **$2,000,000.**
grade separation Archer and Western Aves., **$350,000.**
grade separation Archer and Ashland Aves., **$300,000.**
grade separation Archer Ave. at Cicero Ave., **$300,000.** CD 2/13/45, under Streets and Roads.

▲ **OHIO**—State Hy. Dpt., Columbus,

1954 HIGHWAY CONSTR.

Clark Co.—New York Central grade separation, Lagonda Ave., Springfield, **$1,525,000.**
Cuyahoga Co.—relocate inner belt main bridge piers, Rte. 42, **$4,500,000.**
Lucas Co.—Door St. grade separation at New York Central R.R., **$2,610,000.**
Maumee River Bridge superstructure, **$4,550,000,** CD 10/29/51.
Starr Ave. grade separation with expressway in Toledo, **$1,125,000.**

1955 HIGHWAY CONSTR.

Cuyahoga Co.—relocate inner belt superstructure main bridge at Cleveland on U. S. 42, **$9,500,000.**
Hamilton Co.—Third St. viaduct, U. S. 50, **$3,290,000**
Seneca Co.—grade separation at Fostoria, New York Central and Chesapeake & Ohio, on Ohio 12, **$1,730,000.**

HIGHWAY CONSTR. AFTER 1955

Cuyahoga Co.—Granger Rd. railroad grade separation in Maple Heights, **$1,600,000.**
railroad grade separation and reconstructed pavement, U. S. 42, **$1,060,000.**
Cleveland innerbelt bridge approach superstructures, U. S. 42, **$9,000,000.**
Cleveland innerbelt bridge piers and abutments, U. S. 42, **$9,000,000,** CD 8/13/52.
Wood Co.—Baltimore & Ohio R.R. grade separation in Wood Co. and Perrysburg, O. bypass, **$1,500,000.**

▲ **O., Akron**—City, City Hall, overpass over Akron-Barberton Beltline tracks, on Seiberling St. **$2,000,000.** CD 12/10/43.

▲ **Tex., Houston**—City, City Hall, 900 Brazos St.; bridge over Buffalo Bayou at 69 St., **$854,624,** Herbert W. Elder, 1737 Harold St., and Fred C. Sandlin, 5811 Doolittle St., consult. engrs.; rein.-con. Bridge No. 1, at a bend in Bayou near Jefferson Davis Hospital **$275,000;** rein. con. Bridge No. 2, at a 2nd bend in Bayou near Jefferson Davis Hospital **$325,000;** 6-lane artery or Memorial Dr. from Shephard into W. Capitol St., **$750,000,** Herbert W. Elder, 1737 Harold St., consult. engr., J. M. Nagle, c/o owner, city engr., CD 6/5/51; Hardy St. Exten. over Bayou into Crawford and McKee Sts., **$3,727,900,** Lockwood & Andrews, Union Natl. Bank Bldg. consult. engrs., CD 12/10/52.

STREETS AND ROADS

▲ **Fla., Miami**—City, City Hall, defeated bonds, street imprvs. **$2,500,000.** CD 10/27.

▲ **OHIO**—State Hy. Dpt., Columbus,

1954 HIGHWAY CONSTR.

Allen Co.—new four-lane pavement, Rte. 25, Bluffton bypass, north of Beaverdam to 2.5 mi. north of Bluffton **$2,400,000.**
new and salvage 2-lane pavement, Rt. 305 east from Lima for 12 mi., **$1,282,000.**
Ashland Co.—four-lane divided hy. Ashland by-pass, Rte. 42, **$2,400,000.**
Belmont Co.—relocate 2.5 mi. new four-lane divided, Rte. 7, near Bellaire, **$3,500,000.**
Clark Co.—from Water to Florence Sts. in Springfield on Rte. 40, **$1,850,000.**
Delaware Co.—7 mi. four-lane divided pavement, Rte. 23, north of Franklin Co. line, **$1,367,000.**
Erie Co.—Milan by-pass, new and salvage 2- and 4-lane pavement, Rte. 250, **$3,000,000.**
Fairfield Co.—3.6 mi. four-lane divided Rte. 33 south of Lancaster, **$1,040,000.**
Franklin and Pickaway Counties—new and resurf. 4-lane divided, 12 mi. Rte. 23, **$3,004,000.**
Gallia Co.—new 2-lane pavement 6.7 mi., east from Jackson Co. line, **$1,650,000.**
Greene Co.—relocate Rte. 42 at Spring Valley for 3 mi. **$1,108,000.**
9 mi. 4-lane pavement, Rte. 35 from Pennsylvania subway to west of Xenia City limits and Baltimore and Ohio overpass, **$5,425,000.**
Hamilton Co.—new 4-lane pavement, Rte. 50, 2.56 mi. west of Cincinnati city limits to Dart St., **$1,363,000.**
Jefferson Co.—Rte. 7, 1.46 mi. near Rayland, **$2,300,000.**
Licking Co.—new 2-lane pavement for 9 mi. Rte. 16 and widen Rt. 310 to Rt. 9 at Granville, **$1,600,000.**
Lucas Co.—South Toledo corporation line to Front St., 4-lane divided pavement, **$1,850,000.**
Front St. interchange in Toledo, **$1,400,000.**
Summit St. interchange connection in Toledo, **$3,500,000.**
Lucas and Wood Counties—Expressway, Woodville Rd. interchange, north of Toledo, 4-lane divided pavement, **$4,140,000.**
Mahoning Co.—Rt. 18 east of Rt. 45, widen 2- and 4-lane division, **$1,010,000.**
Rte. 7, widen to four-lane divided north of Rt. 224, 3-mi. area, **$1,150,000.**
Muskingum Co.—east of Perry Co. line to Fultonham by-pass, Rte. 22, and New York Central grade separation, **$1,090,000.**
Noble Co.—relocate 5.17 mi. Rte. 21, east of Dexter City, **$1,100,000.**
Pike Co.—3.5 mi. two new lanes of 4-lane divided Rte. 23 from Rt. 335 in Waverly, **$1,520,000.**
Portage Co.—Ravenna by-pass, Rte. 14, **$1,100,000.**
Ross Co.—new 4-lane divided Rte. 23, 4.8 mi., north from Pike Co. line, **$2,800,000.**
4 mi. new 2-lane of 4-lane divided, north from Pike Co. line, Rte. 23, **$1,740,000.**
Summit Co.—Rte. 18, east of Rte. 5 to Martha St. in Akron, **$2,500,000.**
Trumbull Co.—Rte. 5, from Leavittsburg to Rte. 82, 4-lane divided pavement, **$1,400,000.**

1955 HIGHWAY CONSTR.

Butler Co.—Ohio 73, new four-lane divided road north from Middletown 3.8 mi., **$1,611,000.**
Cuyahoga Co.—relocate U. S. 42 in Cleveland from Superior Ave. to East Memorial 8-lane, **$6,500,000.**
relocate U. S. 42 in Cleveland from E. 22nd St. to Superior Ave. inner belt underpasses, **$8,000,000.**
new pavement and interchange on Ohio 17 at Cleveland from Schaff Rd. 140th to Willow Cloverleaf, **$2,397,000.**
Brookpark Rd. extens. 2.45 mi. east from Ohio 10 on Ohio 17, **$1,100,000.**
Hancock Co.—5.12 mi. U. S. 25, north of Findlay, incl. by-pass, **$1,400,000;** 6 mi. U. S. 25 new and salvage four-lane divided north of Findlay to Ohio 18, **$1,060,000.**
Jefferson Co.—relocate Ohio 7, north of Ohio 213 near Steubenville, **$2,035,000.**
Medina Co.—4 mi. U. S. 42, north from U. S. 224 incl. Lodi-by-pass, **$4,000,000.**
Montgomery Co.—relocate U. S. 40, 12.4 mi. east of the Montgomery Co. line, **$6,550,000;** 6.8 mi. new alignment of four-lane, U. S. 25 north from U. S. 40, **$3,055,000.**
1.29 mi. four-lane divided and two-lane service road U. S. 35, east of Dayton, **$1,503,000.**
Ross Co.—relocate new two-lane pavement 5.5 mi. U. S. 23, north of Pickway Co. line, **$1,229,000.**
Stark Co.—new two-lane pavement 6.15 mi. U. S. 21, starting north of Canal Fulton, **$1,400,000.**

HIGHWAY CONSTR. AFTER 1955

Butler Co.—new four-lane divided hy. 2.9 mi., joining U. S. 42, **$1,944,000.**
four-lane pavement, Ohio 4, from Middletown to Posetown with bridges, **$2,000,000.**
Erie Co.—new four-lane divided pavement, Ohio 6 for 10 mi. from Ohio 99, **$6,200,000.**
Guernsey Co.—four-lane divided hy. and bridges 5.4 mi. U. S. 21, **$1,718,000.**
Hamilton Co.—4-lane divided hy. and three interchanges, U. S. 50B, Shepard and Jimson Rds., **$3,081,000.**
interchange, U. S. 50, **$960,000.**
new road, 6.79 mi. north from Evendale to Maud, **$4,718,000.**
Millcreek Expressway, 4-lane divided hy. 1.13 mi. from Towne St. to Paddock, **$2,529,000.**
Millcreek Expressway, 4-lane pavement from B. & O. R.R. to Towne St. 0.86 mi., **$4,742,000.**
Millcreek Expressway, 4-lane pavement 2.12 mi. from Colevain to Clifton, **$3,983,500.**
Huron Co.—reconstructed and new 2-lane pavement 5.35 mi. Ohio 18, west of Ohio 168, **$1,650,000.**
Jefferson Co.—new two-lane portion of future 4-lane pavement, 3.3 mi., north from 0.3 mi. south of Brilliant, **$2,225,000.**
Lake Co.—Limited Access Expressway, 6-lane hy., two railroad grade separations and 12 bridges over highways and streams, 13,39 mi. between Willoughby and Painesville, **$11,520,000.**
Licking Co.—4-lane divided pavement and bridge, U. S. 40, from 0.7 mi. west of Hebron to 3.5 mi. east of Ohio 13, **$3,200,000.**
Logan Co.—Expressway and bridge U. S. 40 over Muskingum River at Zanesville, **$2,750,000.**
Lorain Co.—4-lane divided pavement, 1.2 mi. Ohio 6, west of Lorain, **$1,080,000.**
widen, pave and resurf. 7.1 mi. Ohio 6, **$1,730,000.**
Lucas Co.—4-lane limited access Ohio 120 for 2 mi. approaching Toledo, **$7,200,000.**
4-lane limited access 3.3 mi. Ohio 120R from north of Toledo to Michigan state line, **$4,300,000.**
remainer of work on Toledo's Summit St. interchange, Ohio 120R, **$3,150,000.**
4-lane divided pavement, U. S. 20, north of Ohio 2, **$2,125,000.**
Monroe Co.—2-lane pavement and bridge, Ohio 7, north from 0.8 mi. north of Ohio 536, **$1,600,000.**
Montgomery Co.—4-lane divided hy. from eastern Dayton to Greene county line, **$1,222,000.**
Morrow Co.—Bypass 10.35 mi., east from 2.7 mi. east of Cardington, **$1,679,000.**
Pickaway Co.—4-lane divided pavement 5.52 mi. U. S. 23, through Circleville, **$3,339,000.**
two new lanes of 4-lane divided hy. U. S. 23 6.29 mi. south of Circleville, **$1,500,000.**
new two-lane and 4-lane pavement, widn. 2-lane pavement and resurface, 4.43 mi. U. S. 23, **$1,592,000.**
Sandusky Co.—4-lane divided hy. and Freemont bypass, U. S. 20, U. S. 6 and Ohio 12, **$2,830,000.**
Summit and Portage Counties—4-lane divided hy. 7.81 mi. U. S. 224, east of Ohio 8, **$2,550,000.**

Tuscarawas Co.—relocation of 4-lane pavement 2 mi., east from U. S. 250 and bypass, **$1,500,000.**

relocation of 4-lane pavement 2.5 mi., from 1.3 mi. west of Uhrichsville to U. S. 250, **$2,000,000.**

Williams Co.—new 2-lane pavement 9.86 mi. Ohio 384 from east of Ohio 2, **$1,620,000.**

new 2-lane pavement 7.26 mi. Ohio 384, from Ohio 191 to U. S. 6, **$1,080,000.**

Ohio 76, widen and resurf. 8 mi. north from U. S. 20, **$1,100,000.**

▲ **Tex., Corpus Christi**—City, City Hall, voted bonds, street imprvs. throughout city, grading, drainage repairing, base courses, asphalt and concrete topping. **$2,500,000.** CD 11/13.

AIRPORTS

▲† **Ark., Blytheville**—AIR BASE—U. S. Eng., 300 Broadway, Little Rock, (1) rehabilitation 15 bldgs. incl. shops and hangars (2) plans by Branson, Rutledge, Haralson & Mott, Merchants National Bank Bldg., Ft. Smith, warehouses, airmen's dormitories, mess and BOQ bldgs. also gasoline and lubricating oil storage facilities (3) plans by Delta Eng. Co., Blytheville, roads, railroad spurs, sewage collection sys. (4) plans by Horner & Shifrin, Shell Bldg., St. Louis, Mo., airfield paving and hazard removal; rehabilitation of Blytheville Air Force Base, $8,000,000 appropriated. **$20,000,000** overall cost. CD 10/13.

▲† **O., Dayton**—WAREHOUSES—U.S. Eng., 830 W. Broadway, Louisville, Ky., two 240,000 sq. ft. masonry warehouses, Gentile Air Force Depot. **$2,000,000.**

LATIN AMERICA

▲ **Brazil, Sao Paulo**—State of Sao Paulo, Sao Paulo, has received plans by Greeley & Hansen, 220 S. State St., Chicago 4, Ill. U. S. A., for six sewage treatment plants at Vila Leopoldin, Pinheires, Case Verde, Penha, Santo Amaro and Sao Caetano. **$25,000,000.** CD 7/23/52.

▲ **Mexico, Mexico City**—Hnos. Parra Hernandez, P. de la Reforma 166, Mexico City, plans 200-room hotel. **$3,000,000.**

FOREIGN

▲ **Union of South Africa**—South African Road Federation, Johannesburg, plans products pipe line, Durban to Johannesburg. **$25,000,000.**

PUBLIC BUILDINGS

▲ **Calif., Redwood City**—SCHOOLS—City, City Hall, **$3,200,000** bond election Feb. 19, Highway School, administration bldg. and addnl. facilities for Sequoia Union High School District. CD 5/27/52.

▲ **Calif., San Jose**—SCHOOLS—San Jose City Unified School Dist., 408 Almaden Ave., **$7,500,000** bond election Feb. 5, school addns. CD 2/27/48.

▲ **Colo, Englewood**—SCHOOLS—School District No. 1,2650 South Broadway, voted bonds, 3 elementary schools, 1 Junior High School, 4 elementary school addns., high school addn. and Junior High School imprvs. **$2,500,000.** CD 11/5.

▲ **Conn., New Haven**—DORMITORY FOR AGED—State, Ralph G. Macy, P. Wks. Comr., State Office Bldg., Hartford, plans by Henry F. Ludorf, 100 Pearl St., Hartford, 3 story, 432-bed capacity, dormitory for aged, Chapel and Orchard Sts. **$2,500,000.**

▲ **Fla., Miami**—CITY HALL—City, City Hall, defeated bonds, city hall. **$4,250,000.** CD 10/27.

▲ **Mich., Ann Arbor**—ENGINEERING, etc.—State, A. N. Langius, dir. State Bldg. Dpt., Lansing,

brick, steel automotive engineering bldg., North Campus, **$1,850,000,** CD 2/8/52;

undergraduates library, **$2,650,000,** CD 10/31/52;

brick law library, **$700,000,** CD 10/31/52;

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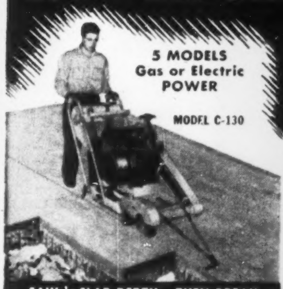

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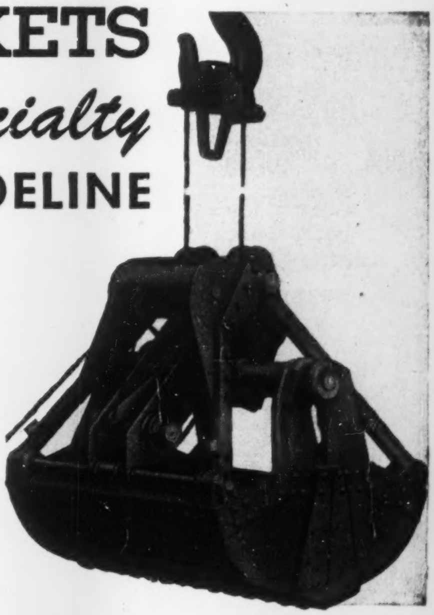

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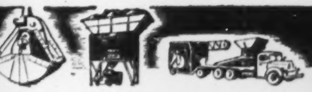

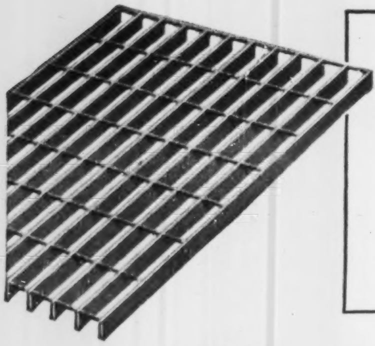

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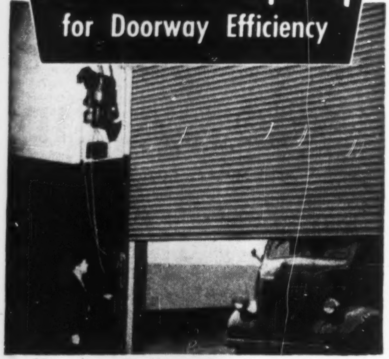

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television-radio bldg. incl. tower transmitter and full equipment facilities, **$500,000;**
addn. to College of Architecture and Design, **$1,000,000**, University of Michigan.

▲ **Mich., East Lansing**—ANIMAL INDUSTRIES BLDG., etc.—State, A. N. Langius, dir. State Bldg. Dpt., Lansing, plans by O. J. Munson, 409 Wilson Bldg., Lansing, animal industries bldg., **$5,300,000**; brick, steel, concrete school of education bldg., **$3,500,000**; utilities, **$1,950,000**, Michigan State College. CD 1/29/52.

▲ **Pa., Wynnewood**—HIGH SCHOOL—Phila. Archdiocese, 310 N. 19 St., Phila., plans by Paul Henon, Fox Bldg., Phila., high school. **$2,500,000**.

▲ † **Va., Radford**—FACILITIES, etc.—U. S. Eng., foot of Front St., Norfolk, rehabilitation existing facilities and constr. addnl. new ones required for more powder lines at Radford Arsenal. **$6,418,000**. Hayes, Seay, Mattern & Mattern, 609 S. Jefferson St., Roanoke, consult. engrs. CD 6/20/52.

▲ **Va., Richmond**—SCHOOLS—Henrico Co., 22 and Main Sts., cancelled **$4,000,000** bond election Dec. 8, school constr. CD 11/20.

▲ **Alta., Edmonton**—CITY HALL—City, Municipal Bldg., plans by Dewar, Stevenson & Stanley, 618 Northern Hardware Bldg., city hall, between 99 and 100 Sts. and 102A and 103 Aves. **$2,500,000**. CD 4/22.

▲ **N. B., Chatham**—GENERATING PLANT—New Brunswick Electrical Power Comn., 527 King St., Fredericton, steam generating plant addn. **$2,500,000**. CD 2/18/47.

COMMERCIAL BUILDINGS

▲ **Calif., Azusa**—HOMES—Olympic Homes, 124 S. Atlantic Blvd., Los Angeles, plans by L. C. Major & Assoc., 11015 S. Paramount Blvd., Downey, 237 frame, stucco homes, Lark Ellen Ave. and Arrowy Hy. **$2,500,000**.

▲ **Calif., San Francisco**—APARTMENT—Owner, c/o Angus McSweeney, archt., 612 Howard St., 14 story apartment, 1000 Chestnut St. **$2,000,000**.

▲ **Ill., Chicago**—APARTMENT—La Salle National Bank trustee, 135 S. La Salle St., Zone 3, plans by Hirschfield & Pawlan, 327 S. La Salle St., Zone 4, 181-unit apartment, 179 E. Delaware St. **$2,000,000**.

▲ **Mo., Normandy (St. Louis 21 P. O.)**—HOSPITAL—St. Vincent's Hospital, 7301 St. Charles Rock Rd., Zone 21, 4 story, brick, concrete, steel hospital addn., also modernization, reconditioning existing bldg. **$2,400,000**.

▲ **N. J., Trenton**—SHOPPING CENTER—Lawrence Garfield, 24 Commerce St., Newark, plans by Kelly & Grazen, 80 5 Ave., New York, N. Y., shopping center. **$12,000,000**.

▲ **Pa., Phila.**—APARTMENT—Park-Cloverly Apartments, Att. Louis H. Cohan, Market St. Natl. Bank, plans by Harry Sternfeld, 1411 Walnut St., apartment, 452 W. School Lane. **$2,000,000**.

▲ **Pa., Phila.**—DEPARTMENT STORE—Phila. Bd. Directors of City Trusts, 120 S. 3 St., N. Snellenburg & Co., 11 and Market Sts., plans by Thalheimer & Weitz, 1325 Walnut St., department store modernizing, alterations and addns. **$4,500,000**. CD 10/14/52.

▲ **Pa., Phila.**—HIGH SCHOOLS—Roman Catholic Archdiocese of Phila., 310 N. 19 St., Bishop Neuman High School, **$2,000,000**; Boys High School in Northwest Sect., **$2,000,000**; Girls' High School in Northwest Sect., **$2,000,000**; Girls' High School, 26 and Mifflin Sts., **$2,000,000**.

▲ **Wis., Milwaukee**—SHOPPING CENTER—Charles Lubotsky, 2733 W. Wisconsin Ave., Zone 8, and Abe Luber, 2510 N. Sherman Blvd., Zone 10, plans by Lefebvre & Wiggins, 810 E. Center St., Zone 12, shopping center, **$10,000,000**, first section about $5,000,000.

INDUSTRIAL BUILDINGS

▲ **Ill., East Alton**—PLANT—Olin Industries Inc., John M. Olin, pres., East Alton, plant addns. for fabricating facilities for metals division, **$5,500,000**.

▲ **Mass., Dedham**—PLANT—Rust Craft Publishers, 1000 Washington St., Boston, plans by Graham, Anderson, Probst & White, Inc., 80 E. Jackson St., Chicago, Ill., plant, Fairbanks Ave. **$3,000,000**.

▲ **N. J., Pennsauken**—PLANT—U.S. Steel Products Co. Div., U.S. Steel Corp., 30 Rockefeller Plaza, New York, N. Y., 168,000 sq. ft. plant for producing steel drums. **$2,000,000**. CD 3/28/52.

▲ **N. J., Point Pleasant**—POWER PLANT—Jersey Central Power & Light Co., 501 Grand Ave., Asbury Park, power plant on Gull Island in Manasquan River, Ocean Co. **$35,000,000**. Burns & Roe, Inc., 233 Broadway New York, N. Y., consult. engr.

▲ **Ont., Preston**—FACTORY—Standard Machine & Tool Co., Ltd., 870 Ottawa Ave., Windsor, plans by Allward & Gouinlock, 57 Bloor St. W., Toronto, factory on 100-acre site, **$2,000,000**.

UNCLASSIFIED

▲ **Okla., Chickasha**—TRANSMISSION LINE—Public Service Co., 600 S. Main St., Tulsa, transmission lines. **$2,000,000**. R. K. Lane, c/o owner, engr.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

December 21 Connecticut December 22, 23 Massachusetts
December 22 New Hampshire

STREETS AND ROADS

December 21 Connecticut December 22 Massachusetts

BIDS ASKED—BUILDINGS

▲ **Mass., Newton**—INDUSTRIAL CENTER—B.A. 12/21—General Electric Co., Lamp Div., 50 High St., Boston, industrial center, incl. 202x252 ft., masonry office and distribution facilities, site imprvs. $2,000,000. Cram & Ferguson, 248 Boylston St., Boston, archts.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Frouge Constr. Co., Inc.**, 74 Goodsell St., Bridgeport, Conn., CA, **$3,369,000**, Proj. B/A-A-82 ADMISSIONS and INTENSIVE TREATMENT BLDG., Fairfield State Hospital, NEWTOWN, CONN. State Office Bldg., Hartford, Conn. Bids Nov. 10. CD 11/17, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

STREETS AND ROADS

December 22 Maryland

BIDS ASKED—BUILDINGS

▲† **N. J., Fort Monmouth**—HOSPITAL—B.A. 3/16—U. S. Eng., 80 Lafayette St., New York, 13, N. Y., 200-bed hospital $1,000,000-$3,000,000. Extended date. Ziegler, Childs & Paulson 921 Bergen Ave., Jersey City, N. J., archts. CD 7/20.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **General Electric Co.**, 1 River Rd., Schenectady, N. Y. LB **$3,089,147**, power equip. for Flushing line, IRT Div. Manhattan and Queens Boros; and Liberty Ave. Line, IND Div., Queens Boro, NEW YORK. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Dec. 4.

▲ **NEW JERSEY**—New Jersey Turnpike Auth., Administration Bldg., New Brunswick,

Dravo Corp., Neville Island, Pittsburgh, Pa. CA **$3,934,250**, Contract N-1, main span piers and 15 east approach piers for Newark Bay Bridge on Newark Bay-Hudson County Extension of N. J. Turnpike, Hudson Co.;

Merritt-Chapman & Scott Corp., 260 Madison Ave., New York, N. Y., CA, **$1,876,600**, Contract N-3, 41 piers for westerly approach to Newark Bay Bridge on Newark Bay-Hudson County extension of N. J. Turnpike; CA, **$879,540**, Contract N-4, east abutment and 16 approach piers for Newark Bay Bridge on Newark Bay-Hudson County Extension of N. J. Turnpike, Jersey City, Hudson Co. Grand total $6,690,390. Bids Nov. 24, awarded Dec. 8. CD 12/4, under LB.

▲ **Napp-Grecco Co.**, 1900 McCarter Hy., Newark, N. J., CA, **$2,381,931**, sewage disposal plant, and sewer trunk line system with 4,000,000 gal. daily capacity KEARNY, N. J. Town Council, Town Hall, Kearny, N. J. Bids Oct. 28. CD 10/1.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,

Pontz-Hess, Inc., P.O. Box 41, Lititz, Pa. CA **$511,839**. 24,567 ft. crushed aggregate base with bit. surf. variable width one I-beam bridge T.R. 100, Berks Co.;

M & S Constr. Co., Inc., 1558 Electric Ave., East Pittsburgh, Pa. CA **$1,256,606**. 27,170 ft. rein.-con. variable width plate girder bridge T.R. 68, Butler Co. Bids Nov. 20, awarded Dec. 4. CD 11/24, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Harry & Sidney Waxman**, 17 Neptune Ave., Brooklyn 29, N. Y. Owner Builds. **$1,440,000**. two 6 story APARTMENTS, 711 Montauk Court and 2675-85 E. 7 St., BROOKLYN, N. Y. CD 9/9.

▲ **Abe Spirer**, 1177 Grand Concourse, New York 52, N. Y. Separate Contracts, **$2,400,000**. 14 story APARTMENT, Henry Hudson Parkway between 235 and 236 Sts., NEW YORK, N. Y. CD 8/18.

▲ **Rachel Ancowitz**, 202 E. 179 St., New York 57, N. Y. Separate Contracts, **$1,340,000**. 14 story APARTMENT, 256 St. between Arlington and Independence Aves., NEW YORK, N. Y. CD 4/24.

▲ **Bronxville-Devon Corp.**, c/o Tito DiVincenzo, archt., 2 Columbus Circle, New York 19, N. Y. Separate Contracts. **$1,900,000**. APARTMENT, Midland Ave. between Kimball Ave. and New York-Buffalo Thruway, YONKERS, N. Y. CD 9/11.

▲ **Moyer Brothers**, Altoona, Pa. LB **$1,983,000**. general contract SCHOOL, CARLISLE, PA. Carlisle Joint School Dist., Carlisle, Pa. Hunter, Caldwell & Campbell, Altoona, Pa., archts.

▲ **Charles Tompkins Co.**, 907 16 St. N.W., Wash., D. C., LB, **$6,268,000** 350-bed HOSPITAL, 12 and Varnum Sts. N.E., Wash., D. C. Providence Hospital, 2 and D Sts. S.E., Wash., D. C. Bids Dec. 8. CD 11/25.

SOUTH

BIDS ASKED—BUILDINGS

▲ **Va., Portsmouth**—HOUSING—B.A. 1/12—Portsmouth Redevelopment & Housing Auth., 1900 Columbia Ave., 515 two story, masonry, concrete public housing units, $4,250,000. Plans deposit $50. William, Coile & Blanchard, 424 Dinwiddie St., Portsmouth, Va., archts. CD 8/26/52.

SOON LETS CONTRACT—BUILDINGS

▲ **Fla., Coral Gables**—RESIDENCE HALL—University of Miami, 1200 Campo Santo Ave., Coral Gables, soon lets contract, Julian S. Eaton Residence Hall, $1,500,000. CD 11/17.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **The Jordan Co.**, Andrews Rd., Columbus, Ga., CA, **$3,582,000**, HOSPITAL, SAVANNAH, GA. Chatham Co. Hospital Auth., Court House, Savannah, Ga. Bids Nov. 24. CD 12/1, under LB.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Mich., Ann Arbor**—SCHOOL—B.A. 1/13—City, Bd. Educ., 2 story, brick, steel, concrete Senior High School, $5,500,000, Fulton, Krinsky & DeLaMotte, 6014 Euclid Ave., Cleveland, O., archts. CD 3/3/53.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Abco Constr. Co.**, 44 S Ludlow St., Dayton, O. CA Est. **$1,500,000**. 1 story OFFICE and DISTRIBUTION BLDGS., extending along Helena St. from northeast corner of McCook Ave., DAYTON, O. Arthur Beerman, Commercial Bldg., Dayton, O.

▲ **Sever-Williams Co.**, Washington Court House, O. CA Est. **$1,350,000** 3 story CHAPEL LIBRARY BLDG. with AUDITORIUM, SPRINGFIELD, O. Bd. Directors Wittenberg College, Springfield, O. CD 2/11/52.

▲ **Jas. McHugh Constr. Co.**, 6449 S. Parkway, Chicago, Ill., LB, **$6,170,000**, general contract COUNTY GENERAL HOSPITAL addn., WAUWATOSA, WIS. Milwaukee County Institutions & Grounds, 8731 Watertown Plank Rd., Wauwatosa, Wis. Bids Dec. 3. CD 11//10.

▲ **Owen Ames Kimball Co.**, 38 Pearl St. N.W., Grand Rapids, Mich. CA **$1,187,700**. brick, steel, concrete ADMINISTRATION BLDG., GRAND RAPIDS, MICH. Aquinas College, Marywood, Grand Rapids, Mich. CD 4/13.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

January 5 Oklahoma

BIDS ASKED—BUILDINGS

▲ **Tex., Dallas**—STUDENT UNION—B.A. 1/6—Southern Methodist University, 72,000 sq. ft., brick, structural steel student union bldg. $1,250,000. Plans deposit $50. Walter P. Moore, 2 Pinedale St., Houston, and Zumwalt & Vinther, Merchants Security Bldg., Dallas, engrs. Mark Lemmon, 1210½ Main St. and Geo. & Abel B. Pierce, 4511 Kyle St., archts. CD 10/15.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **O'Rourke Constr. Co.**, 1001 W. Commerce St., Dallas, Tex., CA **$1,244,000**, 186x190 ft. and 78x103 ft., structural steel paint hangar and stripping bldg., GRAND PRAIRIE, TEX. Chance Vought Aircraft Div. of United Aircraft Corp., Box 5907, Dallas, Tex. Bids Oct. 28. CD 11/6, under LB.

▲† **U.S. Eng.**, 4735 E. Marginal Way, Seattle 4, Wash. cancelled bids to have been opened Dec. 18, 1 story, 52,200 sq. ft. masonry hospital, 1 story, 4,000 sq. ft. frame dental clinic, Great Falls Air Force Base, Inv. 54-80, GREAT FALLS, MONT. Est. **$1,500,000**. CD 11/16.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Walter D. Giertsen**, 900 Glenwood Ave., Minneapolis, Minn. LB **$2,094,000**, altering, imprv. BUILDINGS 1, 2, 3, 5, 6, and 7, and outside electrical distr. sys. at Veterans Admin. Hospital, MINNEAPOLIS, MINN. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Dec. 8. CD 10/7.

▲ † **Alport Constr. Co.**, 218 Title Guaranty Bldg., St. Louis 1, Mo. LB **$1,648,880**, addnl. constr. and rehabilitation of BUILDING No. 102 at St. Louis Ordnance Plant, 4300 Goodfellow Blvd., ST. LOUIS, MO. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Dec. 3. CD 10/19.

▲ **J. C. Nichols Co.**, 310 Ward Parkway, Kansas City, Mo. Owner Builds. **$3,000,000**. HOUSING, Praire Field Dist., near KANSAS CITY, KAN.

▲ **Robert E. McKee, General Contractor, Inc.**, Box 2 Dallas, Tex., CA, **$1,454,000** Base Bid PUBLIC L BRARY, DALLAS, TEX. City, City Hall, Main and Harwood Sts., Dallas, Tex. Bids Nov. 17. CD 12/2, under LB.

▲ **Rambo Constr. Co.**, 2826 Morton St., Fort Worth, Tex., LB, **$2,352,945** constr. STATE HOSPITAL, HARLINGEN, TEX. Bd. for Texas State Hospital and Special Schools, 45 and Lamar Sts., Austin, Tex. Bids Dec. 8. CD 10/30.

FAR WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Fisher Contg. Co.**, 2201 S. 19 Ave., Phoenix, Ariz., CA, **$1,318,000**, runway, taxiway, exten. existing runway, Luke Air Force Base, ENG-04-353-54-24, PHOENIX, ARIZ. U.S. Eng., 751 Figueroa St., Los Angeles, Calif. Bids Dec. 3, awarded Dec. 5. CD 12/9, under LB.

▲† **Gaasland Constr. Co., Inc.**, 1155 Ellis St., Bellingham, Wash., LB, **$1,724,845**, est. $1,946,000 "purex" facility at Hanford Works, with waste disposal facilities, incl. underground tanks and pipe lines Inv. AT (45-1)-821, RICHLAND, WASH. Atomic Energy Comn., Richland, Wash. Bids Dec. 2. CD 11/16.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Sully-Miller Constr. Co., 1500 West 7 St., Long Beach, Calif., LB, **$62,596**, resurf. 1.9 mi. between Dana Pt. and Doheny Park, Orange Co. CD 11/18;

Griffith Co., 1060 S. Broadway, Los Angeles, Calif., LB, **$406,369**, wid'n., surf. 4.6 mi. Figueroa between Lomita Blvd. and 19 St., Los Angeles Co.;

Winston Bros. Co., 1532 S. California St., Monrovia, Calif., LB, **$1,958,110**, surf. 2.5 mi., 5 rein.-con. bridges on Santa Fe Freeway between Browning Ave. and 1 St., Santa Ana and Tustin, Orange Co.;

M. H. Golden Constr. Co., 3485 Noell St., San Diego, Calif., LB, **$1,187,569**, grading, surf. 1.7 mi., 4 rein.-con. box girder bridges near Balboa Ave. San Diego Co. Bids Dec. 3. CD 11/13.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Zoss Constr. Co.**, 1037 N. Cole Ave., Los Angeles, Calif., CA, **$1,951,916**, Pacoima Junior High SCHOOL, Pacoima LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Dec. 2. CD 12/8, under LB.

▲ **Darrigo & Powers**, P.O. Box 1235, Stockton, Calif., LB, **$1,088,419**, HIGH SCHOOL, NORTH SACRAMENTO, CALIF. Grant Union High School Dist., 1400 Grand Ave., Del Paso Heights, Calif. Bids Dec. 2. CD 11/20.

▲ **R. Pedersen & Sons**, 446 Clark St., Fresno, Calif., CA, **$1,921,490** general contract;

Marelich Mfg. Co., 44 Layne Pl., San Bruno, Calif., CA, **$325,000**, heating and ventilating work for 14 ward bldgs., Phases 3 and 4, Porterville State HOSPITAL, PORTERVILLE, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids Nov. 24, awarded Dec. 1. CD 12/2, under LB.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Steel Co. of Canada Ltd.**, Wilcox St., Hamilton, Ont., Separate Contracts, **$3,650,000** SINTERING PLANT, BIN BLDG., SCREEN BLDG., and FILTER BLDG., HAMILTON, ONT. W. L. Chater, c/o owner, ch. engr.

▲ **Redfern Constr. Co. Ltd.**, 36 Toronto St., Toronto, Ont., CA, Est. **$2,500,000** 3 story, 60x600 ft., concrete, brick, mental HOSPITAL admin., 999 Queen St. W., TORONTO, ONT. Dpt. P. Wks., Parliament Bldgs., Toronto, Ont. Bids Sept. 22, awarded Dec. 4. CD 9/4.

▲ **Empire Enterprises Ltd.**, 711 Common St., Montreal, Que. Owner Builds. **$1,284,000** HOUSING DEVELOPMENT, Montee St. Jean, POINTE CLAIRE, QUE.

U. S. POSSESSIONS

BUILDINGS

LOW BIDS AND CONTRACTS

▲ † **Framorco, Inc.**, Apartado 1293, Panama Republic of Panama. LB **$1,458,964**. ORDNANCE FACILITIES, Inv. 54-18, COROZAL, CANAL ZONE. U. S. Eng., Box 4970, Jacksonville, Fla. Bids Nov. 10. CD 9/10.

▲ **Hebb & Narodick Constr. Co., Inc.**, 232 Fourth Ave. N., Seattle, Wash. and **C. Pietsch, Jr.**, Honolulu, T. H. Day Labor. **$2,500,000**. 19 story Hawaiian Towers APARTMENT, HONOLULU, T. H. Wimberly & Cook, Honolulu, T. H., and R. L. Durham & Assoc., 1100 Denny Way, Seattle, Wash., archts.

LATIN AMERICA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **The Fluor Corp., Ltd.**, 176 Broadway, New York, N. Y., U. S. A., CA **$5,810,000**, Oil REFINERY, MINATITLAN, MEXICO, Petroleos Mexicanos, Juarez, 104 Mexico City, Mexico. Awarded Dec. 2. CD 7/1/48.

(Proposal Advertisements see pp. 70 to 72)

1460 ft.

it took a B-G
Runabout
Ditcher
only 8 hours to
dig 1460 feet of
coral rock.

see your B-G distributor
or write
Barber-Greene
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MAYO

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GROUTER

CONVERTS TO
PEA SHOOTER
•
INJECTS SOIL
STABILIZER

Here's one of the handiest all around tools you can have on the construction job—the Mayo Pneumatic Grouter. Places low pressure grouts in tunnels, mines, shafts, foundations, railroad subgrades, sunken pavements and injects soil stabilizers. Converts easily to pea shooter. No moving parts within the grout. Capacity: 3½ cubic feet. Charging height: 3 ft. Write today for free bulletin 13-A.

MAYO TUNNEL & MINE EQUIPMENT
LANCASTER, PA

UNIT PRICES

Expressway overpass Detroit, Michigan

Extremely close competition characterized the bidding on a bridge carrying Second Boulevard over the Edsel Ford Expressway in Detroit. L. A. Davidson, Lansing, Michigan, the low bidder, was less than ½% below the second low bidder and only 6% below the highest of five.

The $381,287 contract was awarded by the Michigan State Highway Department, Charles M. Ziegler, commissioner.

Work consists of constructing a new reinforced concrete and steel bridge with a bituminous concrete wearing course; road grading and surfacing; and appurtenant work.

The substructure is comprised of two reinforced concrete cantilever type abutments about 12-ft, 3-in high and three reinforced concrete column and girder type piers about 26-ft, 3-in high.

All substructure units are supported on spread footings.

Four rolled-beam superstructure spans support a reinforced concrete slab with 60-ft clear roadway and two 10-ft sidewalks.

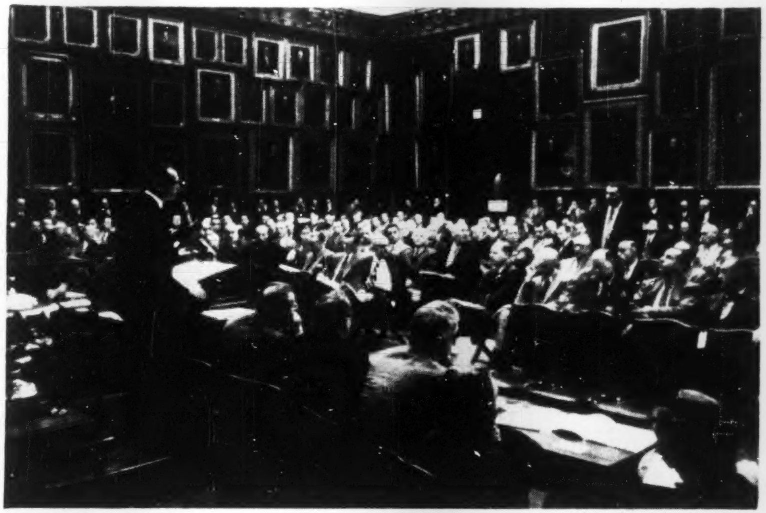
Minimum wage rates include: tractor operators, $2.85 per hr; carpenters, $2.70 per hr; form setters, $2.60 per hr; and mixer operators, $2.13 per hr.

Bidders include:

1C	L. A. Davidson, Lansing, Michigan	$381,287
2	F. C. Atletwed, St. Clair, Michigan	382,915
5	J. Piozai, Inc., Detroit, Michigan	404,745

Bids. 8-26-53 Items	Unit	Quantity	Unit Prices 1 C	 2
Rem trees, 8" to 12" dia	ea	24	$30.00	$30.00
13" to 24" dia	ea	19	40.00	55.00
25" to 36" dia	ea	8	100.00	100.00
Remove old pavement	sy	7,738	1.00	1.00
Remove sidewalk	sy	912	1.00	0.50
Remove curb	lf	160	2.00	1.00
Remove asph surface	sy	111	4.00	1.50
Earth excavation	cy	72,837	1.44	1.40
Porous backfill grade B (loose measure)	cy	554	4.00	4.00
Sand-gravel backfill (loose measure)	cy	3,233	2.50	2.75
Trim & finish backslopes	sta	5	40.00	70.00
Cl B culv, 12" (up to 10' deep)	lf	199	5.00	3.50
Sewer (up to 10' deep) 6"	lf	200	1.50	1.50
12"	lf	659	2.50	2.50
15"	lf	111	5.00	3.00
Encased sewer (up to 10' deep) 12"	lf	148	10.00	5.00
Sewer with open joints, 6" (up to 10' deep)	lf	321	1.20	1.00
6" (10' to 14' deep)	lf	540	1.50	1.75
MH 1A (up to 10' deep)	ea	3	300.00	300.00
MH 1AD (up to 10' deep)	ea	1	300.00	300.00
Catch basins (up to 10' deep)				
3B	ea	5	250.00	300.00
3H	ea	2	220.00	300.00
3J	ea	2	220.00	300.00
6B	ea	3	160.00	300.00
Tile traps	ea	5	30.00	50.00
Adjust manhole covers	ea	2	50.00	50.00
Adjust catch basin covers	ea	1	50.00	45.00
Reconstruct manholes	ea	2	200.00	150.00
Reconstruct catch basins	ea	1	200.00	25.00
Abandon catch basins	ea	2	100.00	50.00
Fine grading & cleanup	sta	12	40.00	50.00
Conc curb, detail 2				
6" face	lf	369	2.50	2.50
7" face	lf	495	2.55	2.50
Conc. curb, detail 2 8" face	lf	63	3.00	3.00
9" face	lf	433	2.70	3.00
Conc curb, detail 2A				
6" face	lf	492	2.50	2.50
9" face	lf	29	4.00	3.00
Conc curb & gutter, detail 10, 7" face	lf	114	3.00	3.50
detail 10A, 7" face	lf	71	4.00	3.50
Conc driveway return, detail 15	lf	42	4.00	3.50
Conc pvmnt, 7" uniform	sy	49	8.00	4.50
8" uniform	sy	1,562	6.50	4.75
Conc base crse, 9" uniform	sy	3,776	5.00	4.75
Pvmnt reinforcement	sy	3,758	0.66	0.70
Bit bond coat, AE-2	gal	612	0.50	0.50
Bit conc wearing crse	t	480	14.00	15.00
4" conc sidewalk	sf	6,455	0.50	0.50
Two cable guard rail	lf	350	2.00	2.50
Cable expansion take-ups	ea	2	30.00	30.00
Mulching	t	1	60.00	50.00
Restoring roadsides	ac	1	200.00	300.00
Cl A seeding	ac	1	100.00	300.00
Special conc nose	ea	1	200.00	50.00
Remove msry & conc	cy	25	30.00	10.00
Protective fence	ls	1	300.00	500.00
Abandon handholes	ea	1	100.00	25.00
Rem ornamental street light units	ea	9	100.00	125.00
Remove handholes	ea	2	50.00	25.00
Rem post foundations	ea	1	100.00	25.00
Remove wood poles	ea	7	60.00	60.00
Remove 2 #6 overhead lines	lf	825	1.00	1.10
F&I 2 #6 overhead street lighting lines	lf	395	2.00	2.10
Rem overhead street lighting units	ea	8	60.00	0.60
F&I light units	ea	5	200.00	200.00
#1 three-way manholes	ea	1	600.00	600.00
#1 two-way manholes	ea	3	400.00	600.00
#1 corner manholes	ea	2	300.00	600.00
Street type "D" handhole	ea	7	250.00	200.00
6" sewer	lf	457	2.00	2.50
12-4" encased conduits	lf	140	20.00	20.00
9-3" conduits	lf	50	20.00	16.00
6-3" conduits	lf	28	20.00	7.00
4-3" conduits	lf	788	7.00	6.00
3-3" conduits	lf	48	20.00	5.00
2-3" conduits	lf	485	6.00	4.50
1-3" conduits	lf	360	5.00	4.00
F&I 7500 V two s/c #8 lead covered street light cable	lf	3,150	1.90	2.00
one s/c	lf	405	1.00	1.00
Fit-up wood street lighting cable poles	ea	2	525.00	600.00
F&I and fit-up new wood pole as street light cable pole	ea	1	605.00	625.00
Salv ornamental street light unit, install on new foundation	ea	4	300.00	235.00
Salv ornamental street lighting unit, install on bridge	ea	3	250.00	250.00
Ornamental street lighting unit (type OP) install on new foundation	ea	4	300.00	250.00
Miscellaneous work	ls	1	1,400	1,500
Unclassified excavation	cy	1,436	4.00	4.00
Steel sheet piling left in place	sf	3,220	2.00	3.00
Grade A conc substructure				
6A	cy	468.5	44.00	40.00
6B	cy	394.6	44.00	40.00
Grade A conc superstructure 6B	cy	663	50.00	46.00
Cement	bbl	2,260	3.70	3.50
Steel reinforcement	lb	204,796	0.10	0.10
Str stl-erection	lb	734,300	0.015	0.015
Spiral shear developers	lb	4,500	0.60	0.50
Struct tie, 12"x12"x6"	ea	1,194	0.60	0.50
12"x12"x8"	ea	1,592	0.70	0.65
½" joint filler	sf	261	1.00	1.00
¾" joint filler	sf	30	2.00	1.00
1" joint filler	sf	834	0.70	1.00
Hot-poured rubber-type filler	lf	482	1.00	1.00
Copper	lb	381	1.50	4.50
Joint waterproofing	sf	497	1.00	1.00
Bridge railing	lf	421.7	14.00	15.00
Field painting	ls	1	2,000	3,500
Rubbed surface finish	sf	8,050	0.40	0.50
3" fibre conduit	lf	212	1.00	1.00
4" fibre conduit	lf	2,523	1.00	1.00
Bit bond coat, AE-2	gal	214	0.50	0.50
Bit conc wearing crse	t	156.6	14.00	15.00
6" sewer (up to 10' deep)	lf	140	1.50	2.00
6" perforated sewer	lf	214	2.00	2.00
5" galv iron pipe sleeves-placed	ea	50	5.00	16.00
16" steel pipe sleeves-placed	ea	2	20.00	30.00
22" Cl pipe sleeves-placed	ea	2	25.00	50.00
Porous backfill, grade B, (loose measure)	cy	21	10.00	4.00
Sand-gravel backfill (loose measure)	cy	477	3.00	3.00
Grouted flagstone paving	sy	776	7.00	10.00
Heat & house substructure concrete	cy	863.1	0.10	5.00
Heat and house superstructure concrete	cy	663	0.10	5.00

BUSINESS AND FINANCE



ENR photo by Compton

HIGHWAY MONEY—Representatives of 475 underwriting firms gathered in the great hall of the New York State Chamber of Commerce in downtown Manhattan last week to get the details of the $280-million Indiana Toll Road issue.

Mackinac tries again in big borrowing week

This week is going to see another sharp test of investors' eagerness to finance construction. After snapping up last week $300-million worth of General Motors Corp. debentures, investors face another heavy docket of bond issues, including:

- $121 million of housing bonds offered by local housing authorities and backed by the Public Housing Administration.
- $280 million of Indiana Toll Road Commmission bonds (picture)
- The long-expected, often-deferred bond issue to finance a bridge across the Straits of Mackinac, totaling $99.8 million.

The fact that experienced investment banking syndicates are launching three big issues at this time of the year, when the big life insurance investors usually have pretty well committed their funds, suggests they are feeling confident about their market.

Several things have happened in the couple of weeks to give them confidence. For instance, investors snapped up the highly rated General Motors bonds, bidding more than the offering price for them. The Federal Reserve System is talking about increasing the money supply to keep pace with a growing economy (page 70). Government bond prices have been strong lately. And bank loans to business, which usually rise sharply at this time of year, have actually declined in some recent weeks.

• Plenty of money—All these factors make it easier for anyone borrowing now for construction. There is plenty of money around. That is undoubtedly a major factor in General Motors' decision to break its traditional policy against borrowing long-term funds in the public market. This is not only GM's first publicly sold bond issue, but the biggest public issue ever sold by a corporation. It will help provide GM with the sinews of war for the great 1954 sales battle now just getting under way.

Plenty of investors are interested in tax-exempt municipal bonds, too. That's why the $280-million Indiana Toll Road bond issue has attracted the largest underwriting group that ever handled a municipal sale (picture). This will be the second-largest toll road borrowing in history, second to the $326-million issue sold by the Ohio Turnpike Commission in mid-1952.

Construction will begin right after the financing is finished. It's expected that the eastern end of the toll road will be finished in time to hook up with the western end of the Ohio Turnpike.

But probably the most interesting event this week will be the news of what sort of bids are made on the Mackinac project. The Mackinac Bridge Authority is making every effort to get the project financed this year, in spite of the advice of its original investment counselor, Van Ingen & Co. The reason is that the state legislature's grant of $417,000 annually for operation and maintenance expires if financing is not completed by Dec. 31 this year.

If a bid satisfactory to the authority is received, fabrication of bridge caissons will start within a week. Merritt-Chapman & Scott holds a $25,735,000 agreement for caissons and underwater foundations, while the superstructure cost will be $44.5 million on a contract with American Bridge Co. Construction costs have climbed $3.5 million since contracts originally were signed last winter.

Construction would begin as soon as possible in the spring, with the hope that the bridge could be ready for use by motorists in November of 1957.

AEC wants industry to put up some money for first atomic power plant

The Atomic Energy Commission is stepping up its efforts to gain private industry's participation in building and operating its first utility-size nuclear powerplant (ENR Oct. 29, p. 24).

AEC has just issued a second invitation for private investors to put risk capital in the newly announced project to build a nuclear reactor for generation of electric power. The bid went out after a series of talks between AEC and the companies already working in some phase of nuclear power reactor development.

Though AEC isn't saying what happened at these conferences, it has let slip that no attractive, firm offer for large-scale industrial participation has been received. This doesn't surprise some AEC officials, who are pessimistic about getting much private capital into the venture, but still hope for other forms of private participation.

(Continued on page 68)

As an inducement AEC people point out that financial participation would give such a private group first-hand experience with the new nuclear technology in building and operating a large-scale reactor, designed specifically for power-producing purposes.

One possible applicant is in sight. Five companies, including Bechtel Corp., of San Francisco, are forming a new corporation, Nuclear Power Co.,—just in case they might get interested in building a nuclear power plant. The other companies are all electric utilities: American Gas & Electric Corp., New York; Commonwealth Edison Co., Chicago; Pacific Gas & Electric Co., San Francisco; Union Electric Co., St. Louis.

• Held up—Decisions which might hinge on proposals for private financing are being delayed until AEC is sure all bids are in. The deadline is February 15. The first of these decisions is the selection of a site for the plant. While AEC has said the plant—which will have a minimum capacity of 60,000 kw—might be located near one of its heavy-power-using gaseous diffusion plants. But the commission is still free to put the plant somewhere else if it could be fitted into a private financing proposal. Several engineering and architectural decisions are being delayed for the same reason.

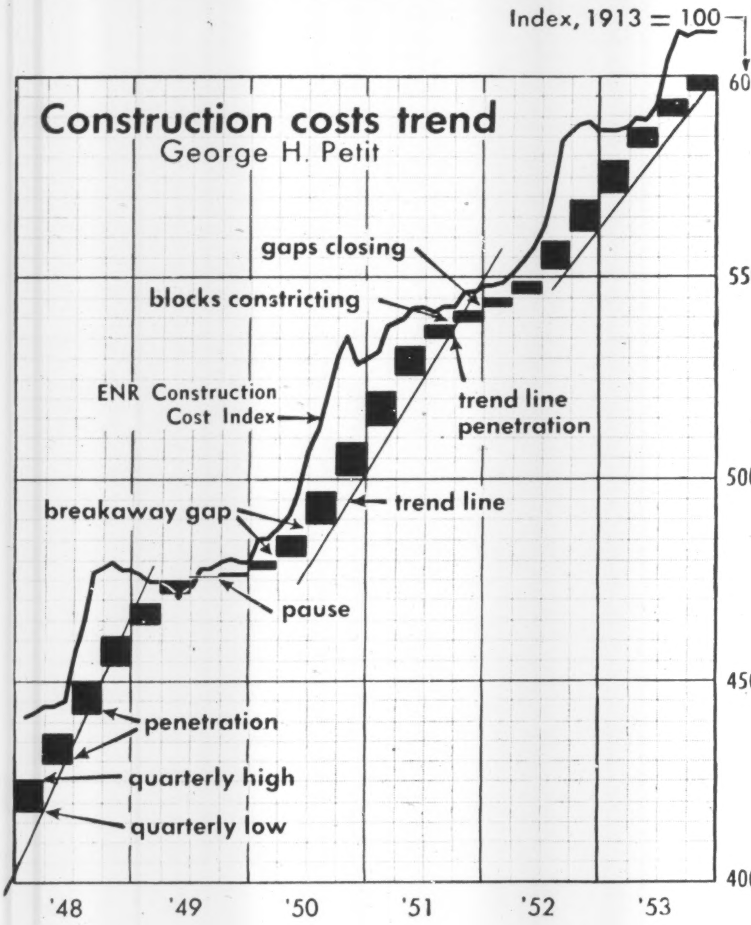
Private companies, AEC believes, could work on construction of the more conventional parts of the proposed power plant, and operate both the plant and the reactor.

While it may be possible to operate the conventional portions of the reactor under separate management, AEC officials would prefer a single management, with the hope that private industry will take on the job.

• Free field—In like manner, industry has nearly a free field for proposed ways in which it could participate. Some participation may come from "gifts" or "exchanges." An example would be the sort of technical aid already furnished in other AEC projects.

A second form of participation would be through contract arrangements. There's some risk for private firms here, but there is also the possibility that government guarantees could be written into contracts.

A riskier type of participation would go like this: The private group would be a partner. The government would build and own the reactor part of the plant, but industry would depend on output of the plant to return its investment, and possibly part of the U. S. investment.



Petit chart shows rise in costs should keep slowing down in 1954

The rise in construction costs will continue to lose mementum in 1954, according to the cost prediction chart worked out by George H. Petit (chart above). The slowdown is shown by all three indicators: (1) The smaller gap between the third-quarter and fourth-quarter blocks; (2) the shrinking of the block itself in the final quarter of 1953; (3) perhaps most important, the trend line penetrated the fourth-quarter block.

For an explanation of how the Petit theory works, see page 92 of ENR's 1953 Construction Costs Issue (Oct. 2).

Business briefs . . .

• Spending for plants and equipment in the first quarter of 1954 will be about $6.5 billion, says the Commerce Dept. and the Securities & Exchange Commission. That's well above the $6.1 billion racked up in the open construction season of the first part of last year.

• Fluor Corp., Ltd. plans to sell publicly about $1,750,000 of new common stock to raise new working capital.

• U. S. Lift Slab Corp. has been formed in Austin, Tex., to license the Youtz-Slick lift-slab construction method (ENR Nov. 12, p. 25). The company is controlled by a group headed by Jack Frost, Dallas oil man, who will be president.

• Mt. Vernon Bridge Co., Mt. Vernon, Ohio, has been purchased by a group of Pittsburgh investors from Columbus Pipe & Equipment Co., of Columbus, Ohio. Clyde G. Conley and David Lowenthall, both of Mt. Vernon, will become president and sales vice-president, respectively, of the organization.

THE LONGER LOOK:

To forecast business trends, economists keep a careful eye on construction statistics. They indicate business plans.

Economists frequently look to the construction industry for clues as to what is happening—or what is about to happen—in other industries. This is particularly true at times like the present when some business decline seems in prospect.

The search of economists for some foolproof way of forecasting business ups and downs has led them to such phenomena as sunspots and aspirin sales, just as weather forecasters have looked for omens in the stripes of woolly bear caterpillars. In a more serious effort, the National Bureau of Economic Research has studied some 800 economic series, tracing their ups and downs over periods ranging up to almost a century.

Some of these—such as measurements of retail sales, industrial production, factory employment and business profits—have shifted pretty closely with general business activity. More tantalizing, however, has been the quest for indicators that typically move up and down *ahead* of business in general. Out of 800-odd studied, 75 series were found to have led in hitting top and bottom ahead of the pack often enough to be considered seriously. Of these 75 series, 17 came from the field of construction—all of them statistics concerning contract and prices.

Why have construction statistics established such a striking record in heralding ups and downs in general business? Principally because construction—and especially *planning* for construction—must anticipate the needs of the industries it serves. In slack times, industrial, commercial and residential needs accumulate. With the first signs of improvement in business, plans are made to catch up with those needs and to anticipate new demands along those lines. It is in the statistics reporting plans and contracts, therefore, that the increase in construction activity first appears.

On the way down, also, there is reason for a drop in building plans and contracts before business in general falls off. Private construction thrives on growth and expected growth. After good times have continued for a while, the slack resulting from the preceding bad times gradually is taken up. The accumulated demand for new housing, factories and commercial buildings is largely met. The quickened pace of construction can then be maintained only by the promise of further improvement in business conditions. So even a tapering off in the rise of a business boom probably will bring a drop in *planning* for additional construction, and thus in contracts—even though actual construction work may continue to increase for a time.

Public works plans do not have the same reputation in business forecasting as plans for private construction. They are determined by much different considerations.

In the past, federal construction has been used to counteract business downturns. And the Eisenhower Administration expects to increase federal construction again if necessary. So nothing solid can be learned about future business trends by watching the volume of federal contracts.

Like federal work, construction plans by state and local governments are also not dependent on profit possibilities. State and local construction plans are particularly dependent on the attitude of the voters and on ability to raise money. In good times, voters are more inclined to approve bond issues and local governments are more likely to be in a good credit position. In times when business is off, local governments with good credit ratings have no trouble borrowing at attractive rates, since there is less competition from corporate borrowers.

The National Bureau of Economic Research has further narrowed down the 75 "acceptable" series with good records in leading business in general. A list of eight has been adopted for close scrutiny on a current basis, and two of these eight are taken from the construction field. The complete list is as follows:

(1) Business failures, industrial and commercial (total liability)
(2) Industrial common stock price index
(3) New orders, durable goods industries
(4) Residential building contracts (floor space)
(5) Commercial and industrial building contracts (floor space)
(6) Average hours worked per week in manufacturing
(7) New incorporations
(8) Wholesale price index (28 basic commodities)

This list was developed on the basis of behavior in business cycles before 1939. But it is interesting to note that the only time in the postwar

(*Continued on page 70*)

What eight business indicators show

The National Bureau of Economic Research has eight key indicators for forecasting business trends. Right now, it finds that six are signaling a downturn . . .

			Last shift in direction
(1)	Business Failures	↓	Feb., 1951
(2)	Wholesale Price Index	↓	Feb., 1951
(3)	Residential Building Contracts	↓	May, 1952*
(4)	Industrial Common Stock Prices	↓	Jan., 1953*
(5)	New Orders, Durable Goods	↓	Feb., 1953*
(6)	Average Weekly Hours Worked	↓	Apr., 1953
	. . . and two have continued to rise . . .		
(7)	New Incorporations	↑	June, 1951
(8)	Comm. & Indus. Building Contracts	↑	Jan., 1952

* Month-to-month fluctuations make it difficult to determine exact date of shift in direction until general movement has become clear. For instance, industrial stock prices have been rising for three months, but this is not yet accepted as a shift in direction by NBER.

years when all eight indicators were moving down at the same time (calculated in moving averages) was at the end of 1948. This, of course, just preceded the recession of 1949.

Despite a fairly impressive consistency in heralding general business movements, even these eight carefully selected indicators can by no means be accepted as ideal forecasting devices. Before the 1949 recession, for instance, half of them had been sliding downward since 1946! While four indicators were signaling the onset of an economic decline, most sectors of the economy were advancing to new heights. Two of the four series which seemed to point to a recession while two-and-a-half years of improving business remained were—the two building contract series.

All of which leaves us with the conclusion that careful analysis of economic statistical series in general, and construction plans in particular, may give a pretty good indication of business ups and downs. But they are not nearly of as much help in telling us precisely when.

Two New York firms decide on a merger

John W. Harris Associates, Inc., and Hegeman-Harris Co., Inc., both of New York, have decided to merge. Directors of the two firms have elected John W. Harris president of the new company, which will continue to do business as Hegeman-Harris Co., Inc.

Back in 1917, with the late John C. Hegeman, Harris founded Hegeman-Harris, and personally supervised construction of such widely diversified landmarks as the Tomb of the Unkown Soldier, Harvard University's School of Business, all major buildings in the Rockefeller Center group.

With a group of colleagues, Harris formed John W. Harris Associates in 1939. This company, retaining its financial interest in Hegeman-Harris, has completed many other projects.

Contractors sharpen pencils on Washington, D. C. bids

In the District of Columbia these days, when contractors want a job they all want it. Here's what happened when the Corps of Engineers asked for bids to build an Air Force dormitory at Bolling Field:

There were 25 bidders, nearly all of them from the Washington area. The low bid was $198,830. And fourteen other bidders were also below the government's estimate of $229,200.

Money for growth

FRB plans to make sure U. S. will have money

The Federal Reserve Board came out with some reassuring news for construction men this week. FRB has developed a long-range policy of constantly increasing the supply of money as the U. S. expands. The idea is that as this country gets bigger, it will need a larger supply of money in order to keep prices stable.

FRB economists figure that over the long run the increase in the money supply should be about 3% a year. But they figure that the Federal Reserve will vary this percentage up or down to adjust for any tendency to inflation or deflation. For instance, if prices seem to be rising too fast, FRB will not increase the supply of money; if prices seem to be declining, the Federal Reserve will help out by making money easier.

For construction men, this means money will not become unduly hard to borrow as long as this policy is in the ascendant. This, quite naturally, is being hailed with delight by businessmen in other fields.

Take the auto industry. Business analysts for General Motors Corp. have been in Washington arguing for a policy of this kind. Other big auto makers have also pushed the idea. The Federal Reserve's new policy was known to GM's top executives and discussed by them before they made their recent decision for a heavy capital spending program (page 67).

This does not mean the Administration has adopted inflation as a policy. But it is certainly anti-deflationary. It will mean the most precise effort ever made to provide exactly the amount of money needed to sustain growth and at the same time to maintain stable prices.

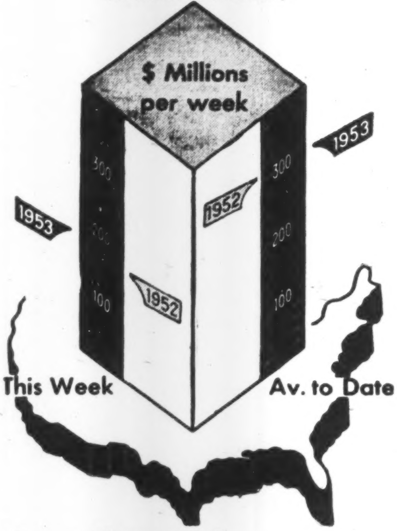
Of course, the money supply has been growing fast over the last half-century, anyway. But this growth has taken place spasmodically. The new policy is designed to put it on a regular, sustained, long-range basis.

Here's how FRB has been using the idea: During the money squeeze of last May and June, FRB economists were asked to work out estimates of how much "growth money" was needed annually. They worked out 3% as a long-range figure.

FRB can increase the money supply in the usual way—by giving commercial banks more lending power. This is not printing-press money. It's the kind created when a loan is made at a bank.

Activity This Week

As reported to ENR
(in millions of dollars)



Amount of contracts let

	This Week	Cumulative 51 wks 1953	1952	% chge
Federal	$6.7	$1,368.7	$4,474.7	−69
State and municipal ..	67.1	4,873.6	4,034.8	+21
Total pub...	73.8	6,242.3	8,509.5	−27
Total priv...	107.9	8,548.9	7,025.2	+22
U. S. total..	**$181.7**	**$14,791.2**	**$15,534.8**	**−5**

Contracts by type of work

	This Week	1953	1952	% chge
Waterworks .	$3.1	$238.0	$219.9	+8
Sewerage ...	9.0	419.8	300.0	+40
Bridges	12.4	671.3	409.1	+64
Highways ..	9.5	1,741.4	1,391.0	+25
Earthwork, waterways .	1.4	344.0	477.8	−28
Buildings:				
Public, excl. hsg.	3.1	1,676.5	4,882.7	−61
Housg., pub.	0.4	373.0	602.8	−38
Housg., priv.	63.8	3,423.4	2,965.2	+15
Commercial	17.3	1,135.1	827.2	+37
Industrial .	23.9	3,131.6	2,691.4	+16
Unclassified .	9.1	1,637.1	1,367.7	+20
Total	**$181.7**	**$14,791.2**	**$15,534.8**	**−5**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Week of Dec. 17 1953	Cumulative 50 Wks 1953	% chge 1952-53
Corporate securities	$290.5	$4,203.5	+19
State and municipal:			
Excluding housing	54.8	4,175.6	+43
Housing	0.7	262.8	−16
Federal loans	1.0	11.6	−67
Federal aid	...	770.9	+40
Total non-federal..	**$347.0**	**$9,524.4**	**+24**
Federal approp.:			
In U. S.	...	$1,566.7	−79
Outside U. S....	...	28.9	−85
Total new capital..	**$347.0**	**$11,120.1**	**−27**

ENR indexes

	1953	Base Years = 100 1913	1926	1949
Constr.	**..Dec '53**	**611.48**	**293.94**	**128.19**
cost	...Nov '53	611.92	294.15	128.28
Bldg.	**....Dec '53**	**435.90**	**235.63**	**123.91**
cost	...Nov '53	436.34	235.87	124.03
Volume	**.Nov '53**	**354**	**144**	**102**
	Oct '53	528	215	153

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.50 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division,
Engineering News-Record
330 West 42nd Street
New York 36, N. Y.

Bids: January 5, 1954

Contract No. 43

WEST VIRGINIA TURNPIKE COMMISSION

Sealed proposals will be received at the office of the West Virginia Turnpike Commission, 1340 Wilson Street, Charleston 5, West Virginia, until 1:00 P.M., Eastern Standard Time, and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia, until 2:00 P.M., Eastern Standard Time, on January 5, 1954, at which time and place said proposals will be publicly opened and read for Contract No. 43 which includes the construction of permanent combined restaurant and service station buildings complete with mechanical and electrical services located at the following service areas:

Bluestone Beckley Morton

and other related work including fuel tanks and piping, sewage disposal systems, sidewalks, paving and landscaping.

Contract documents may be seen and may be inspected by prospective bidders during office hours after December 11, 1953, at the office of Howard, Needles, Tammen & Bergendoff, 804 Greenbrier Street, Charleston, West Virginia, or at the office of Greife & Daley, Architects, 811 Lee Street, Charleston, West Virginia.

WEST VIRGINIA
TURNPIKE COMMISSION
D. H. Morton, Chairman

Bids: January 12, 1954

Dwelling Unit Increment

HOUSING AUTHORITY OF THE CITY OF LOS ANGELES, CALIFORNIA
1401 EAST FIRST STREET
LOS ANGELES 33, CALIFORNIA

NOTICE TO GENERAL CONTRACTORS
CALL FOR BIDS

FOR PART 2—533 DWELLING UNIT INCREMENT
JORDAN DOWNS RECONSTRUCTION
PUBLIC HOUSING ADMINISTRATION
PROJECT NO. CAL 4-16

LOCATION: Between 97th Street and 103rd Street at Grape Street, Los Angeles, California

Plans and Specifications
Prepared By
James R. Friend, A. I. A.
Architect
556 West Fifth Street, San Pedro, California
TErminal 3-5237

Invitation for Bids will be published November 30, 1953. Revised Plans and Specifications dated November 30, 1953 and Bidding Documents ready for distribution December 8, 1953.

Bids to be opened 2:15 P.M. (P.S.T.) January 12, 1954.

For further information regarding bidding Telephone ANgelus 2-2121, Extension 55.

Bids: January 8, 1954

State Highway Construction

Sealed bids will be received by the State of Tennessee Department of Highways and Public Works at their Offices in the Cotton States Building, Nashville, Tennessee, until 10:00 o'clock A.M. January 8, 1954.

DAVIDSON COUNTY:

Project No. U-068-1-(1) Pt. III—The Construction of the superstructure for Victory Memorial Bridge over Cumberland River in Nashville, State Route No. 26.

Project Length—0.349 Miles
Working Days—250
(Unloading Point—Nashville)

Financial Equipment and Experience Questionnaires must be on file with the Department fifteen (15) days before the date of the letting.

No Proposals will be issued after 9:00 o'clock A.M. Friday, Jan. 8, 1954.

THE ATTENTION OF THE BIDDER IS DIRECTED TO CHAPTER 135, ACTS OF 1945.

Contractor must prequalify with the Department of Highways and Public Works in accordance with Chapter 80 of the Public Acts of 1929, before any proposals will be furnished. PROSPECTIVE BIDDERS MUST HAVE FILED THEIR QUESTIONNAIRES FOR QUALIFICATION FIFTEEN DAYS BEFORE THE DATE OF LETTING.

QUESTIONNAIRES WITHIN ONE YEAR OF JULY 1, 1953 OR LATER, WILL BE REQUIRED OF ALL PROSPECTIVE BIDDERS IN THIS LETTING.

Must be certified by a certified public accountant.

The right to reject any and all bids is reserved.

W. H. Leech
Commissioner

Bids: January 5, 1954

Contract 440

ELECTRIC CONDUCTORS, CABLES, ETC.

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, January 5, 1954, for Contract 440, for furnishing, testing and delivering approximately 82,000 feet of electric conductors and cables, power panelboards, safety switches and fuses, complete in every respect, in the numbers and sizes specified, for installation in the Neversink and East Delaware intake and outlet chambers and the Downsville release water chamber of the Delaware system, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of one thousand five hundred dollars ($1,500.00) for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety etc., can be obtained in Room 1316 at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4089) will be received at Denver, Colorado, until January 21, 1954, for furnishing four (4) oil pressure, cabinet-type, actuator governors for regulating the speed of 39,500-horsepower hydraulic turbines for Palisades Power Plant, Palisades Project, Idaho. Delivery is desired within 870 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER
Commissioner

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4088) will be received at Kennewick, Washington, until January 5, 1954, for furnishing labor and materials for siphon crossings, Chandler Canal, Station 285+97 to Station 291+87 and Station 367+00 to Station 372+40, Kennewick Division, Yakima Project, Washington. Location in vicinity of Prosser, Washington. Principal items are: 35,000 cu. yds. excavation; 2,070 cu. yds. concrete structures; 290 cu. yds. concrete canal lining; 435 cu. yds. concrete tunnel lining; 192 lin. ft. 14-ft. 6-in. diameter metal tunnel-liner; and other work. Completion time 300 days. For particulars, address Bureau of Reclamation, Kennewick, Washington; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

INSURE COMPETITION

and get the lowest possible bid for your proposed work by placing your bids wanted advertising in this Section.

Don't limit competition to local bidding alone. Bring it to the attention of contractors the country over. They read this Section every week—make sure your bid is here where they can read it.

OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10:30 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY. (Except for earlier holiday closing)

Bids: January 12, 1954

Construction of Land Section No. 2

THE PORT OF NEW YORK AUTHORITY
LINCOLN TUNNEL
THIRD TUBE
NEW YORK LAND SECTION NO. 2
CONTRACT LT-160.008

Sealed proposals for the construction of the New York Land Section No. 2 for the Third Tube of the Lincoln Tunnel will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, January 12, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $100.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

Bids: January 12, 1954

Construction of New York Marginal Wharf

THE PORT OF NEW YORK AUTHORITY
LINCOLN TUNNEL
THIRD TUBE
NEW YORK MARGINAL WHARF
CONTRACT LT-160.032

Sealed proposals for the construction of the New York Marginal Wharf at Marginal Way between West Thirty-Eighth and West Fortieth Streets, New York, New York, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, January 12, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $50.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

Bids: January 20, 1954

School Construction Projects Nos. 53-105 on St. Thomas and St. John and 53-504 on St. Croix Virgin Islands

Sealed bids in single copy for furnishing all labor, equipment, and materials and performing all work for the project described herein will be received until 3:00 P.M. Atlantic Standard Time January 20, 1954 in the Office of the District Engineer, Insular Division, St. Thomas Virgin Islands and then publicly opened, and read aloud.

Information regarding bidding material, bid guarantee, and bonds, plans and specifications and other proposed contract documents are open for public inspection at the office of District Engineer, Insular Division, Thomas G. Mooney, Charlotte Amalie, St. Thomas, U. S. Virgin Islands; M. A. Dyer Company, 24 School Street, Boston, Massachusetts; Lester M. Marx, Room 2713 Interior Building, Washington 25, D. C.; A.G.C. Office, 1113 Congress Building, Miami, Florida; Builders Exchange, 46 Northeast 6th Street, Miami, Florida; Housing and Home Finance Agency, Room 313 N. Y. Department Store Building, 1064 Ponce de Leon, Santurce, Puerto Rico; and F. W. Dodge Corp., 119 West 40th Street, New York 18, N. Y.

Plans and specifications may be procured from the office of M. A. Dyer Company (Architects-Engineers) at 24 School Street, Boston, Massachusetts, upon deposit of the following:

Christiansted Consolidated School (Elementary portion)	$ 55.00
LaVallee Elementary School	30.00
Christiansted and LaVallee together	65.00
James Madison, Robert Herrick, and James Monroe Elementary Schools together	40.00
Cruz Bay Consolidated School	40.00
East End Elementary School	30.00
Horace Mann Elementary School	30.00
Benjamin Franklin Elementary School	30.00
Cruz Bay, East End, Horace Mann, and Benjamin Franklin together	65.00
All nine schools together	100.00

Deposit shall be only by certified check payable to the Treasurer of the United States, which will be refunded to bona fide bidders upon the return of plans and specifications in good condition within thirty (30) calendar days from the date of bid opening. A bona fide bidder includes any person who submits a bid for a general contract, but does not include a person who submits a quotation to the general contract bidders. To persons who procure plans and specifications upon payment of the above stated amounts, and who do not submit a bid, seventy-five (75) percent of the deposit amount will be refunded upon the return thereof in good condition within thirty (30) calendar days from the date of bid opening. No refund will be made for return after that time.

Bonds, etc.

Each bid must be accompanied by a satisfactory bid guaranty in an amount not less than 5 percent of the total bid.

The successful bidder will be required to furnish a performance bond and payment bond, each in the amount of 100 percent of the contract price.

No bid may be withdrawn until thirty (30) calendar days after the scheduled closing time for the receipt of bids.

The Government reserves the right to award a contract for any or all schools and/or sections on the basis of the basic bid for each school and/or section or any combination of schools and/or sections or by the acceptance of any or all of the alternates, whichever course is in the best interests of the United States.

Description of work

The construction includes:

Section A, St. Croix, Virgin Islands, Project 53-504.

1. Christiansted Consolidated School, (Elementary part) new construction.
2. LaVallee Elementary School, alterations and additions.

Section B, St. Thomas, Virgin Islands, Project 53-105.

Alterations and additions to:

1. James Madison Elementary School.
2. Robert Herrick Elementary School.
3. James Monroe Elementary School.

Section C, St. John, Virgin Islands, Project 53-105.

1. Cruz Bay Consolidated School, new construction.
2. East End Elementary School, addition.
3. Horace Mann Elementary School, new construction.
4. Benjamin Franklin Elementary School, addition.

SEARCHLIGHT SECTION

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OFFICIAL PROPOSAL ADVERTISERS

PLEASE TAKE NOTE

HOLIDAY CLOSING DATES

Dec. 31 issue closes Dec. 24
(10 A.M.)
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(10 A.M.)

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** :EQUIPMENT :USED OR RESALE

UNDISPLAYED RATE

$1.50 a Line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Discount of 10% is allowed if full payment is made in advance for 4 consecutive insertions.

POSITION WANTED and Individual Selling Opportunity Wanted undisplayed rate is one-half of above rate, payable in advance.

Box Numbers in care of our New York, Chicago and San Francisco Offices count as one additional line.

Replies are forwarded each day as received at each of the offices mentioned without additional charge.

EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED RATE

The advertising rate $17.10 per inch for all advertising appearing on other than a contract basis. Contract rate quoted on request.

An advertising inch is measured ⅞ inch vertically on one col. 3 col.—30 inches to a page. E.N.R.

SEND NEW ADVERTISEMENTS to N. Y. office, 330 W. 42nd St., N. Y. 36, for December 31st issue, closing December 18th.

JR. CIVIL ENGINEERS FOR CALIFORNIA

Permanent positions in California's huge highway program. Wide choice of locations. High-grade professional experience. Open to CE graduates or to non-graduates with 2 years' experience. $376 to start, raise in six months. Positions open at this level only.

STATE PERSONNEL BOARD
1015 L Street Sacramento 14, Calif.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

ESTIMATOR—PRINCIPAL duties Quantity Take-off. Experienced on Public Works, Institutional, Educational and Industrial Buildings. Bridges and related construction. Permanent position, excellent salary. Location, Maryland, state education, experience, age, references and availability. P-9854, Engineering News-Record.

OFFICE PROJECT Engineer 30-40 for contractor specializing in competitive bidding public buildings. Position requires job expediting, purchasing, and checking details. Graduate engineer or architect preferred. Stanley W. Newman Co., Mobile, Alabama.

WANTED TUNNEL superintendent experienced in rock and soft ground with tunnel following. State experience, age, reference and type of contract desired. P-9915, Engineering News-Record.

CHIEF ENGINEER with engineering company specializing in chemical plant design. This position requires a man with experience directing the design work of others including project engineers. This is a permanent position with a growing organization. Send complete resume of education and experience to P-9870, Engineering News-Record.

SALES ENGINEER to obtain contracts for engineering services. Contact work will be with industries in the Southwest and headquarters will be Atlanta. We require a man who has actual experience selling engineering services and can show results. Send complete information to P-9871, Engineering News-Record.

ESTIMATOR EXPERIENCED in quantity take-off, determination of unit prices and preparation of complete estimates on building construction and mechanical installations. Work is located in the Southeast. Good pay in permanent position for right man. P-9872, Engineering News-Record.

STRUCTURAL STEEL detailers wanted: experienced: employee benefits, good pay. Five day week. Southern Engineering Company, P. O. Box #1087, Charlotte 1, N. C.

CIVIL ENGINEER, for sales force, age 25-35, some construction experience. Background in soil mechanics and ground water preferable but not necessary. Permanent opportunity with long-established leading firm in interesting phase of foundation construction. Salary commensurate ability. Must be willing to travel, all expenses paid. Location, Middle Atlantic states. Replies held in confidence. P-9652, Engineering News-Record.

Wanted

TRAINED BUILDING CONSTRUCTION ESTIMATOR

To head the department of an established firm located in Central Texas. Excellent salary and opportunity for permanent employment to a qualified man. Must be experienced and able to handle entire estimate. Please give qualifications and references.

P-9978, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED
CONSTRUCTION SUPERINTENDENT

Graduate Engineer; 15 years field experience; experienced in: Estimating; use, capabilities, and limitations of heavy equipment; heavy earth and rock excavation; sewers, water lines, and comparable installations; road construction, asphalt penetration, asphaltic concrete and concrete; culvert and bridge construction. Must submit unquestionable references over past 10 years' performance. Remuneration for right man, at least $15,000 per year. No second-raters. Location: Western New York State.

P-1057, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

TRAFFIC OPERATIONS Engineer: Graduation from an accredited four year college. Major course work in engineering, preferably electrical or civil. Experience as traffic engineer desirable. Salary $5044-$5876 per year. Complete details by writing to Director of Personnel, Municipal Building, Hartford, Conn.

WANTED: EXPERIENCED Chief Mechanic aged 40 to 50 years with thorough knowledge diesel-powered heavy construction equipment for South American project. Employment contract will be given for 15 to 20 month period. Write particulars to P-1053 Engineering News-Record.

SELLING OPPORTUNITIES OFFERED

SALES ENGINEERS — Pittsburgh, Pennsylvania with established national concern selling prefabricated metal products to engineering and construction markets. Position offered is permanent and presents excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Age 24 to 30. Car furnished. Complete training program. Salary and bonus. SW-8254, Engineering News-Record.

PROGRESSIVE EXPANDING Organization servicing construction trades desires sales representatives in the following areas in New York State: Albany, Poughkeepsie, Rochester, Batavia, Jamestown. For interviews in your area write R. J. Thomson & Co., Inc., 2304 Brewerton Road, Syracuse, New York.

POSITIONS WANTED

CONST. SUPERINTENDENT A.1 Long exp. Alterations new complete stores. All Trades, travel salary or bonus basis after job. PW-1076, Engineering News-Record.

(Continued on the following page)

DESIGN ENGINEERS

With structural and concrete design experience applicable to Blast Furnace or Steel Plant Design.

Openings available at our Cleveland, Ohio, offices.

Top Hourly Rates
Permanent Positions
Overtime—45 hour week
No Age Limitations

Write, giving complete background and experience to:

ARTHUR G. McKEE & COMPANY
2300 Chester Avenue
Cleveland 1, Ohio

CHIEF DRAFTSMAN— STRUCTURAL ENGINEER

WANTED — Chief Draftsman — Structural Engineer fully qualified to take complete charge of Drafting Department (about 30 men) of a Company located in northerly area of the Central States.

This is a Structural Steel Fabricating Plant and applicants must have gained experience with a fabricating concern.

Replies will be treated confidentially and appointments made for personal interviews.

P-1061, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

BRIDGE ENGINEERS

Recent Civil Graduate of accredited U.S. college. Should have not less than the following experience on bridges:

Detailers—2 years structural steel or reinforced concrete detailing.

Designers—5 years responsible work on structural steel and concrete including work on long span bridges.

Squad Leaders—3 years responsible charge of squad on structural steel detailing.

Please mail complete resume together with salary required to:

Howard, Needles, Tammen & Bergendoff
55 Liberty Street New York 5, N. Y.

ENGINEER WANTED

Large foreign electric utility company, under English speaking control, desires to engage an exceptional young engineer under 45 years with experience in hydraulic and electric field for permanent service abroad in management and coordination of planning, engineering design and construction of production facilities.

Generous salary, leave and retirement conditions. Letter replies with outline of record are requested and will be held in strict confidence.

P-1069, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS WANTED

(Continued from preceding page)

LANDSCAPE ARCHITECT — civil engineer, Reg. Land Surveyor, age 36, 14 years diversified experience interested in good paying responsible position. Available on 30 days notice. U. S. or o'seas. PW-1058, Engineering News-Record.

CIVIL ENGINEER MIT graduate, B.S., M.S., P.E. in N.Y. 8 years experience in consulting teaching, structural and municipal engineering. Desire position requiring analytical mind, strong theoretical background, ability to organize work of others and see job thru from beginning to end. Presently in charge of small engineering department. Willing to invest. PW-9960, Engineering News-Record.

MATERIALS ENGINEER with 20+ years in steel, concrete, asphalt, soils, welding. Competent administrator. Seeks broader responsibilities in industry or consulting. Reply PW-1008, Engineering News-Record.

EXPERIENCED BOOKKEEPER and Cost Accountant desires position in Latin Countries. Over 45 and had experience in Central America. Reasonable Spanish but not fluent. Sober and steady worker. PW-9983, Engineering News-Record.

PROJECT MANAGER — 20 years experience steam and hydro plants, heavy industrial work, foundations. Will accept either foreign or domestic. Available immediately. PW-9988, Engineering News-Record.

MECHANICAL ENGINEER desires foreign employment in Europe or Latin America. Age 35, married, one child. Previous Latin American experience. Spanish speaking. Over 15 years heavy experience in power, mining, construction, inspection. Presently employed by large Southwestern construction firm but available on short notice. Excellent references. Inquiries invited. PW-9747, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT — 20 years experience power plants, pulp mills, sewage disposal and heavy foundation work. Desire locate in Florida or southeast U.S. Available immediately. PW-9989, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT: concrete pipe manufacture. Considerable experience. PW-9974, Engineering News-Record.

EXPERIENCED YOUNG estimator and assistant superintendent on buildings, bridges, and structures, desires permanent position Mid-West or West. Engineering and business training. Family man. PW-9964, Engineering News-Record.

CIVIL ENGINEER, 27 Single, BSCE. 1½ years experience field engineer earthwork, survey, reinforced concrete and materials. Desires position with construction firm or engineering firm in northern midwest, northwest, or Pacific coast. Available 30 days. PW-9947, Engineering News-Record.

ENGINEER: B.S. in C.E., 32, married, 10 years in supervision of construction, estimating and design. Aggressive and loyal. Foreign service preferred, but not stipulated. Available 1 January 1954, sooner if necessary. Present salary $10,000. H. E. Rose, 1706 North 16th Street, Terre Haute, Indiana.

CONSTRUCTION ENGINEER—C.E. graduate Age 53, twenty-five years successful experience all phases large scale general construction and industrial chemical in direct supervision both in Field and Office. Top References. PW-9855, Engineering News-Record.

CIVIL AND Construction Engineer, 35 years varied, progressive, and responsible experience; including investigations, planning, designing, estimating of costs, reports and supervision of construction on reclamation and flood control projects. 20 years with U. S. Government, 2½ years foreign assignments. PW-1059, Engineering News-Record.

CONSTRUCTION EXECUTIVE, with long experience on buildings, heavy construction, docks, etc., seeks new connection in General Contractor's office or as Project Manager on large job. Thorough organizer, with sound knowledge of all details of contracting, able to assume full responsibility. Inquiries solicited from contractors requiring high grade man. New York or vicinity preferred. PW-1050, Engineering News-Record.

Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.

Send post card for details.

GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 So. 5th Ave. Lake Worth, Florida

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING

OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. *Forty third year*

[illegible] without obligation

WILSON *Engineering Corp.*
College House Offices HARVARD SQ. CAMBRIDGE MASS

POSITIONS WANTED

GENERAL FOREMAN, Forms, buildings, cork insulation (refrigeration) pile driving, carpenter shop and railway construction. Over 25 years experience. Six years foreign experience. Age 53 yrs., sober and reliable. Available at once, foreign or U. S. A. PW-1027, Engineering News-Record.

ESTIMATOR (CHIEF) Heavy construction, excavation, foundations, concrete, all phases. Bidding, cost analysis, sub-contract negotiation, administration. Currently in responsible charge. Wish permanent connection in New York City with Contractor or Consultant. (P.E.) PW-9810, Engineering News-Record.

BRIDGE ENGINEER, wants highway bridge design and drafting on subcontract basis. Will take preliminaries and furnish contract drawings, or design only, on lump sum or percentage basis. Thoroughly experienced, registered Eastern States. Box PW-1035, Engineering News-Record.

GENERAL SUPT., Single, 45 yrs of age, 15 yrs. as supt, 7 yrs. one Co. experience in pipe-line, Asphalt, reinforced concrete, bridges and commercial bldgs, best of references, last employer may be contacted, salary plus percentage, PW-1036, Engineering News-Record.

QUARRY—PROD. Mgr.-Supt. seeks medium to large capacity quarry connection, thoroughly experienced every phase modern operation. Married, 48 yrs. of age. Locate anywhere in U. S.—splendid references. PW-1040, Engineering News-Record.

SELLING OPPORTUNITY WANTED

Sales Executive 20 years experience wishes to represent manufacturer in Eastern States on basis of drawing account against commission. Firm must be A-1. For references & particulars write box RA-9952, Engineering News-Record.

BUSINESS OPPORTUNITIES

Wanted to Buy Surveying and Mapping business. Reply Box BO-9923, Engineering News-Record.

Wanted—Permanent connection with Southern Calif. General Contractor. Am interested as partner or will consider employment as estimator or general superintendent in office or field with opportunity to purchase part interest after trial period. Fifteen years experience on industrial, commercial and public buildings, last seven in business for myself. Prefer medium size contractor. BO-1023, Engineering News-Record.

SPECIAL SERVICE

Typing-Mimeographing of Specifications. Write for free estimate. Elite Typing Service, 314 King St., Woodbury, N. J.

WORK WANTED

Structural Design Work Wanted. Registered Structural Engineers desire sub-contracts for design, preparation of drawings, detailing struct. steel & reinf. conc. for buildings, bridges & special structures. WW-9894, Engineering News-Record.

PERIODICALS

CHAIN AND V-Belt Lengths from diameters and Vice Versa at once; one sheet table $1.00, D. W. Work, Lamar, Mo.

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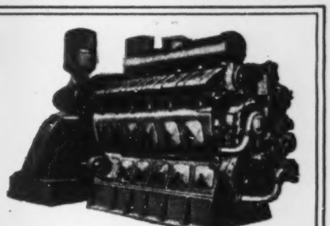

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500	Baldwin	VO-8	750	514	150	Ingersoll-Rand	S-4	225	600
500	General Motors	8-278A	750	720	150	Buckeye	80	240	600
500	General Motors	8-567	720	720	100	Worthington	BB-5	150	600
480	Worthington	DD-8	700	360	100	General Motors	3-268A	150	1200
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FOAMGLAS roof insulation, installed on their Research and Development Building in 1944, has given outstanding insulating performance to The Maytag Company, Newton, Iowa. Maytag reports that insulating their roof with FOAMGLAS has proved an effective aid in controlling with constant efficiency the temperatures and humidities in their laboratories. FOAMGLAS does not absorb damaging moisture which can cut the efficiency of ordinary insulations. This has made FOAMGLAS a major factor in maintaining lower heating and air conditioning costs for Maytag during the past nine years. Maytag's experience has led them to state that they will select FOAMGLAS for their future insulation requirements.

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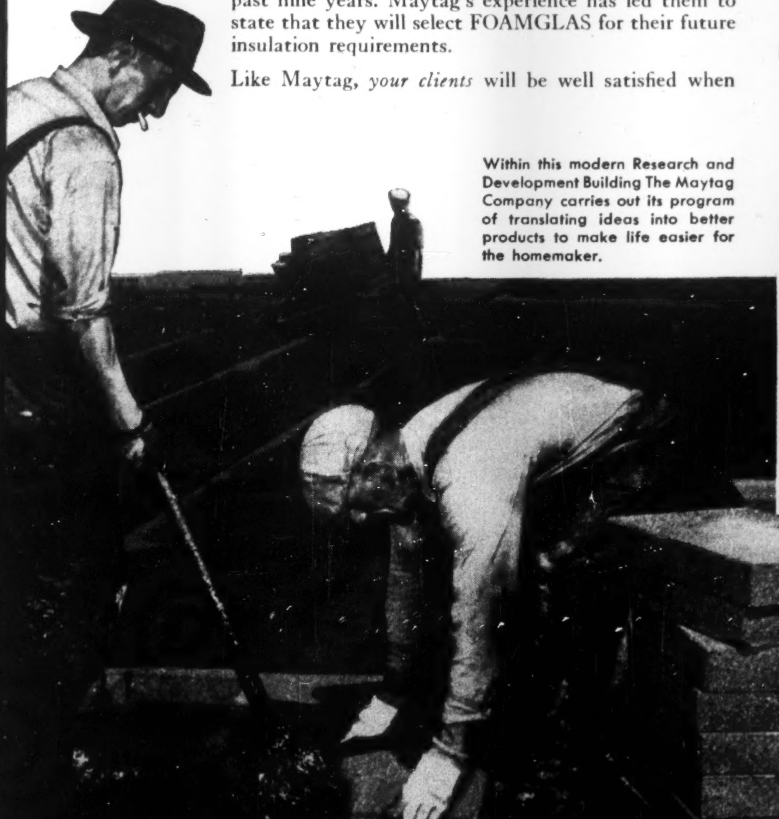

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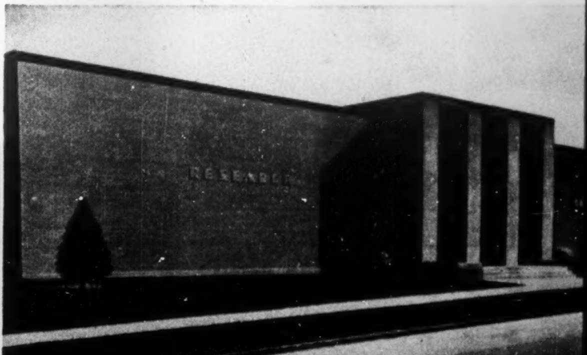

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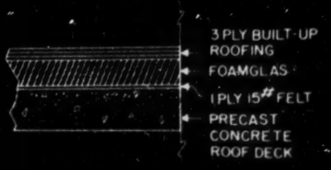

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Workmen find that the lightweight, easily handled blocks of FOAMGLAS are installed surprisingly fast. They are even able to move loaded wheelbarrows across the surface of the FOAMGLAS without damage to this strong rigid insulation.

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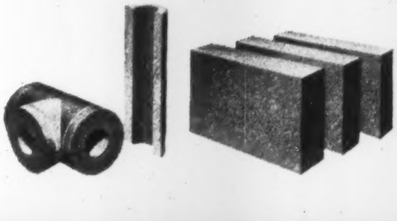

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Above you see one of two Mahon Power Operated Rolling Steel Doors 30′-0″ x 30′-0″ installed in a General Electric Test Cell. At right are four Mahon Power Operated Rolling Steel Doors installed in truck openings of an enclosed shipping dock in a new plant for the Detroit Hardware Company.

ROLLING STEEL DOORS, SHUTTERS AND GRILLES TO MEET EVERY REQUIREMENT

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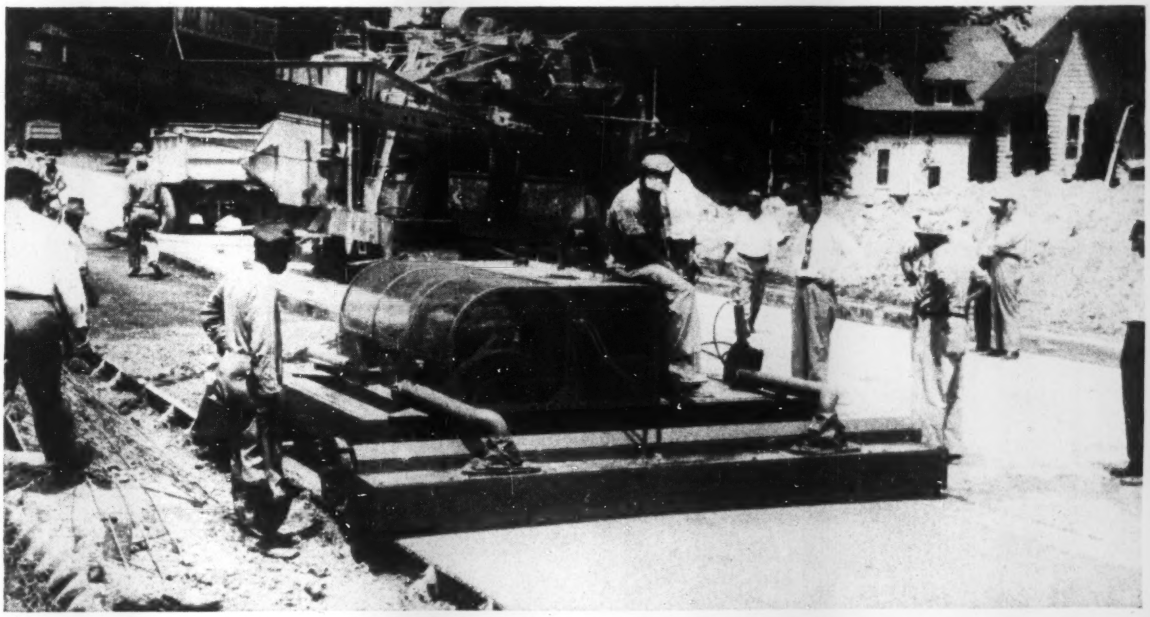

Both spreader and bullfloat may be eliminated from concrete paving with a . . .

Portable hydraulic finishing machine

The big news in construction equipment this week was the introduction of a hydraulically operated finishing machine said to give better quality of finish in half the time required by mechanical types—and fifteen test jobs during the past construction season bear out this claim.

In addition, the tests indicate that the new Flex-Plane machine may be used without the customary bullfloat or longitudinal finishing machine. In fact, on one paving job in Michigan—shown in the above photo—even the use of a concrete spreader was dispensed with.

• **Why hydraulic operation**—According to the manufacturer of the Flex-Plane machine there are two seemingly insignificant yet very important weaknesses in most finishing machines. First, with a rotary screed drive the screed is raised slightly at the end of each stroke. Second, at the end of each stroke the screeds pause and thus create a dragging action. The result, says the manufacturer, is slower, more difficult and therefore more expensive hand finishing.

The hydraulic piston-actuated screed of the Flex-Plane is reported to eliminate both of these undesirable features. Operating in a horizontal plane at all times, the piston cannot lift the screed from the working surface. Also there is no slowing of the screed transversely and consequently there is no screed drag. On every test job the hand finishers worked close behind the machine because of the easy work left for them.

In working super-elevated curves, the machine held the concrete at the high form. Concrete did not roll

(Continued on page 86)

SCREEDS ARE RAISED hydraulically, by finger-tip control, for traveling back and forth on the road forms.

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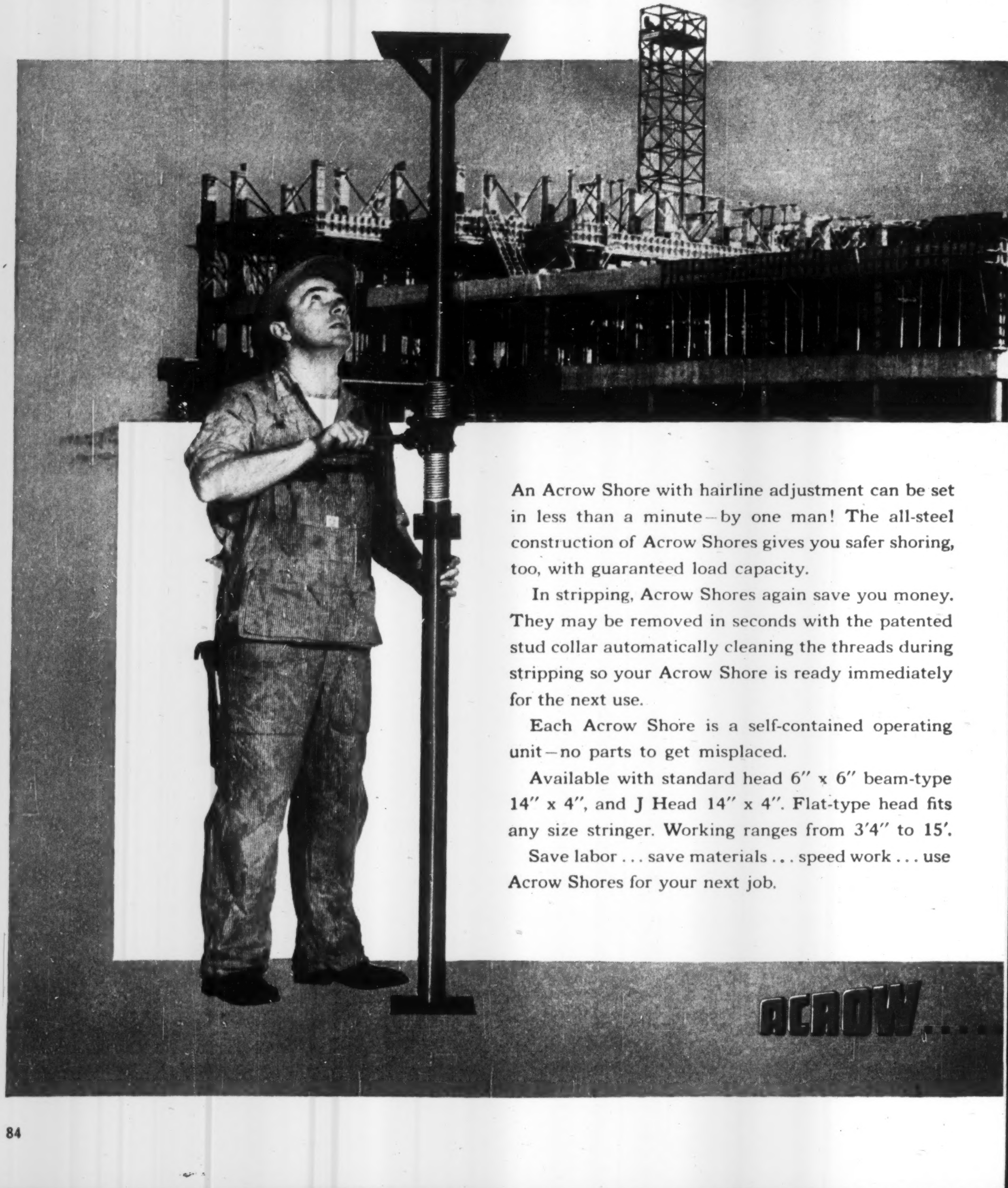

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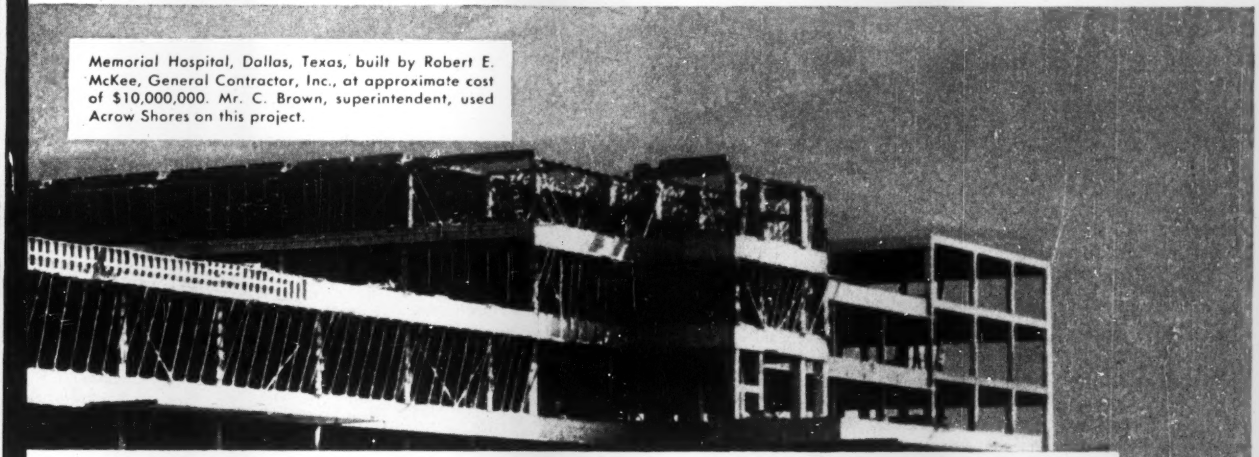

Memorial Hospital, Dallas, Texas, built by Robert E. McKee, General Contractor, Inc., at approximate cost of $10,000,000. Mr. C. Brown, superintendent, used Acrow Shores on this project.

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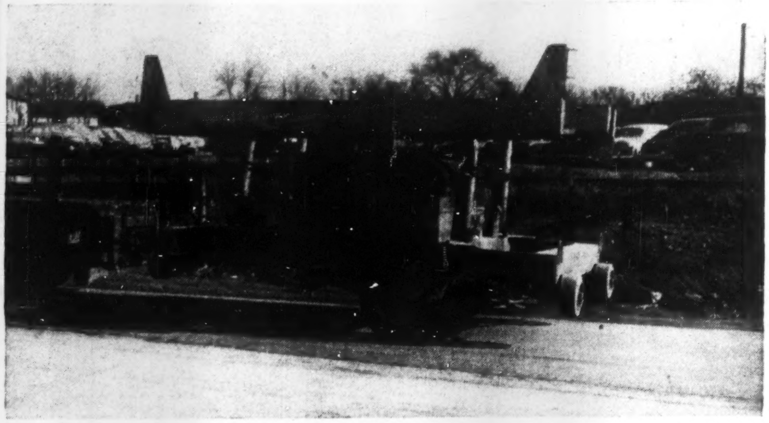

FOR ROAD TRAVEL, screeds fold up and pneumatic-tired wheels are lowered hydraulically, converting the finishing machine into a trailer less than 8-ft wide, to meet state highway travel clearances.

toward the lower form line and carry-back of material to the high form was thus eliminated.

• **Variable speeds**—The speed at which the machine operates is one of the secrets contributing to the quality of the finish. Most mechanically operated machines are limited to four screed stroke combinations whereas the hydraulic screeds operate through an infinite number of stages in a range of 0 to 100 strokes per min.

In addition, the front and rear screeds are independently operated and controlled to conform to job conditions. This means that any combination of travel and screed speeds is available to the operator by simply dialing the speed desired.

The older-type mechanical machine usually works into the concrete at from 8 to 11 fpm and backs up at

Flex-Plane specifications

• **Frames:** Two standard sizes adjustable 10 to 15 ft for half-width construction and 20 to 25-ft for full width pavement. Telescopic in 3-in. increments.

• **Screeds:** Two 12-in. screeds mounted fore and aft, outside of the machine frame. Hydraulically driven independently of each other. Equipped with quick crown-change devices. Wearing plates of high alloy steel, with combination wings. Screeds raised hydraulically above the machine for road travel. Screed strokes 0 to 9-in., adjustable. This adjustment is semi-automatic and can be made while the machine is in motion.

• **Speeds:** Working speeds, 0 to 24 fpm.; travel speeds, 0 to 220 fpm; screed operating speeds, 0 to 100 strokes per min.—all infinitely adjustable. Road travel speed, 25 mph.

• **Controls:** All hydraulically finger-tip controls, centrally located and panel mounted for easy operation. They include: forward and reverse travel, front and rear screed drives, raise and lower transportation wheels, raise and lower trailer tongue pedestal, raise and lower front and rear screeds.

• **Engine:** Air-cooled, 32-hp, equipped with electric starter and 15-gal gasoline tank.

• **Brakes:** Parking and steering brakes combined in tiller type lever. Swinging tiller sideways steers machine and lifting it permits locking chassis for parking or inducing slight drag on steep grades.

• **Track wheels:** Steel double flanged, single flanged and rubber tired flat faced, as required to meet job conditions.

• **Mountings:** Track wheels mounted independent of chain drive; easily removable. Retractible pneumatic-tired trailer wheels mounted on rubber shock absorbers.

• **Weights:** Smaller model (10 to 15-ft width), 9,500 lb; larger model (20 to 25-ft width), 11,500 lb.

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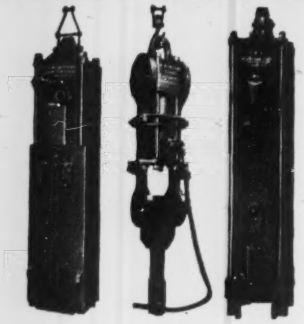

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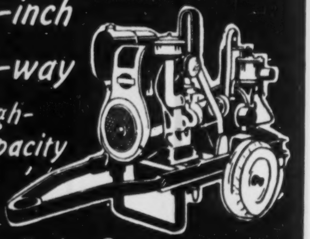

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COMPLETE
WELLPOINT SYSTEMS

little more than 100 fpm. In contrast, the hydraulic machine works into the concrete as fast as 24 fpm or backs down the forms at 220 fpm.

- **Transportability**—Retractable pneumatic tires, built-in towing tongue, raising and lowering jack at the towing end of the machine and hydraulic raising and nesting of the screeds above the machine are all built-in features that make the Flex-Plane more easily transported.

With the screeds raised and nested in transport position, the overall width of the machine is less than 8 ft.—within state highway clearances. Set-up and take-down time are considerably reduced since it is unnecessary to remove or disassemble major components.

- **Lower maintenance costs**—Another big on-the-job advantage claimed by the manufacturer of the hydraulic machine is low maintenance cost. Figures compiled on the test jobs indicated that the cost of maintaining the hydraulic machines is considerably lower than that required for mechanical types.

The fifteen test jobs worked by the Flex-Plane during last summer included a variety of conditions ranging from city street work to state highways; conditions where the machine worked entirely by itself with ready-mixed pours and on high-speed operations with a full complement of allied equipment; half width to full 24-ft width; super-elevated curves; inclines and declines; transitions in width from 0 to 12 ft and transitions in crown from flat to 3 in. All the jobs were reported successfully handled by the test machines.

A further index of the success of the machine is seen in the purchase of the test machines by the contractors who tested them. The Flexible Road Joint Machine Co., Warren, Ohio.

Hard-facing electrode offers abrasion resistance

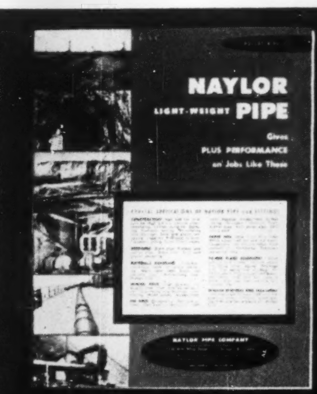
A new electrode has been developed for hard facing heavy construction equipment such as crushers, bucket teeth and lips, etc.

Deposition rate is reported to be far faster than can be attained with cast electrodes and the deposit is said to be smooth, sound and free of pinholes and checks. Abrasion resistance, high compressive strength and impact resistance of welds made with the product are said to result from the

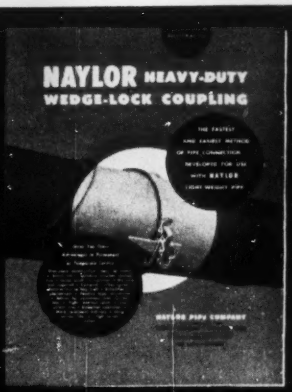
(*Continued on page 88*)

SHORT COURSE ON PIPING

These four bulletins make up a handy reference library on light-weight pipe, connections and fittings and their applications in your field.


NAYLOR
LIGHT-WEIGHT PIPE
Gives PLUS PERFORMANCE on Jobs Like These
NAYLOR PIPE COMPANY

Bulletin No. 507 covers the applications and specifications of Naylor light-weight pipe and fittings.


NAYLOR HEAVY-DUTY
WEDGE-LOCK COUPLING
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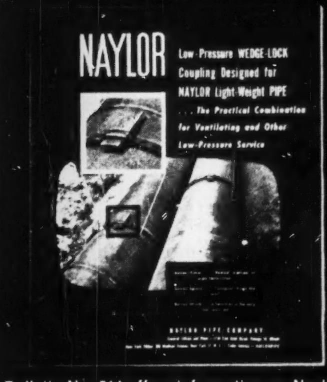
Bulletin No. 513 presents data on Naylor heavy-duty Wedge-Lock couplings for permanent or temporary service.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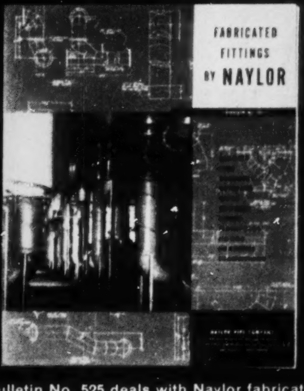
Low-Pressure WEDGE-LOCK Coupling Designed for NAYLOR Light-Weight PIPE
. . . The Practical Combination for Ventilating and Other Low-Pressure Service
NAYLOR PIPE COMPANY

Bulletin No. 514 offers information on Naylor low-pressure Wedge-Lock couplings for vent pipe.


FABRICATED
FITTINGS
BY NAYLOR

Bulletin No. 525 deals with Naylor fabricated fittings for both standard and special requirements.

Copies of these bulletins are available on request.

NAYLOR PIPE

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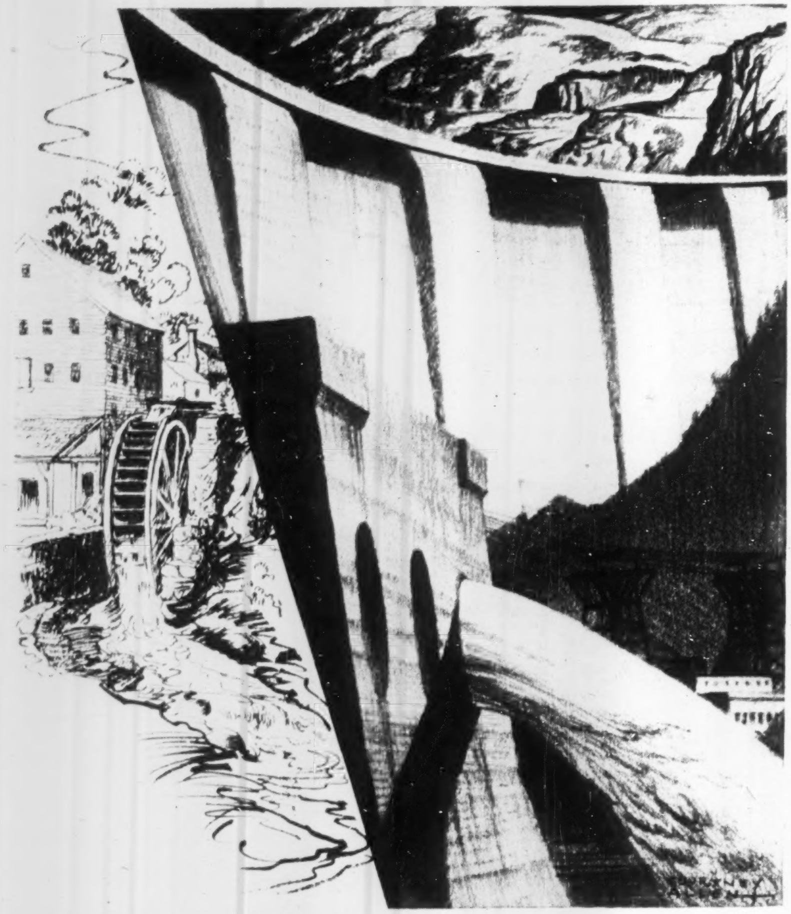

More power by a dam site!

The early water-wheel converted a river's flow into mechanical power — usually enough for one small plant. Today, whole cities — even states — are supplied with *electric* power — and irrigating water, too — by gigantic dams, true monuments to the miraculous accomplishments of the modern construction industry.

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use of chromium and molybdenum as the principal alloys.

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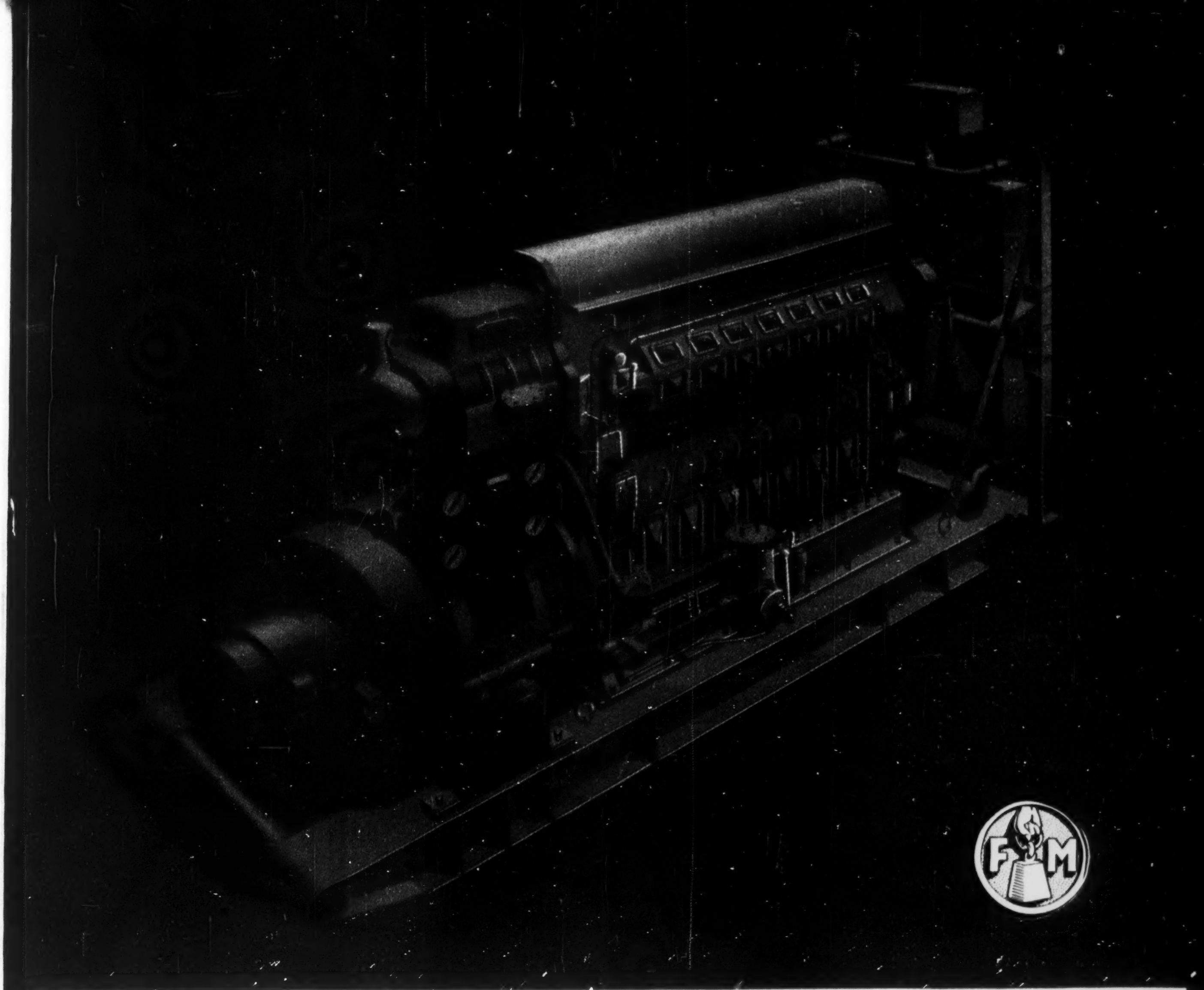
New products briefs . . .

• **Weld strength calculator**—A durably made plastic slide rule indicates both the size of weld required for a given applied load and the weight of a given length of weld in pounds. The calculator gives values for stresses ranging from 2,000 to 20,000 psi and applied loads of from 9,000 to 450,000 lb. On the reverse side of the free pocket-size calculator, available from the Lukens Steel Co., Coatesville, Pa., a basic design data chart for welded connections is graphically shown and formulas for calculating nominal properties of welded connections are listed in convenient form.

• **Electric motors**—A new line of electric motors is being developed to conform to the new National Electric Manufacturers Association standards for mounting dimensions and frame assignments. The complete line of open drip-proof, totally enclosed, fan-cooled and explosion-proof motors—ranging in size from 1 to 40 hp at 3,600 rpm—will be available some time in 1955. The first of three motors (1, 1½ and 2 hp) will become available in January 1954. To be manufactured by The Louis Allis Co., 427 E. Stewart St., Milwaukee, Wis., the new line will include improved ventilation, greater protection, a new conduit box arrangement, new bearing construction and more versatile mounting.

• **Torque converter added**—Performance of the Hough Model HM Payloader tractor shovel is reported to be considerably improved with the addition of a torque converter. According to the manufacturer, the Frank G. Hough Co., 772 Seventh St., Libertyville, Ill., the new drive acts as a cushion for the entire power train, protecting these components against load shocks and reducing maintenance. The converter is a three-element type that multiplies the torque output of the engine in direct proportion to the load requirements.



The Fairbanks-Morse Opposed Piston Diesel Model 38F 5¼. 225 to 750 horsepower. Diesel, Dual Fuel and Spark-ignition options. Other O-P engines available in horsepower ratings to 2400.

Some engines are not good enough

Yes, there are some diesels which just do not have what it takes for the job. They cannot satisfy the owner's pride in smooth, trouble-free operation and are lacking in the ability to square a balance sheet of operational costs and profits. For the more difficult jobs, many engines are simply not good enough.

Maybe you should pay more and get more!

If you want more engine-hours with fewer man-hours, *then* you should have the F-M Opposed Piston Diesel which will cost a little more and give you much, *much* more.

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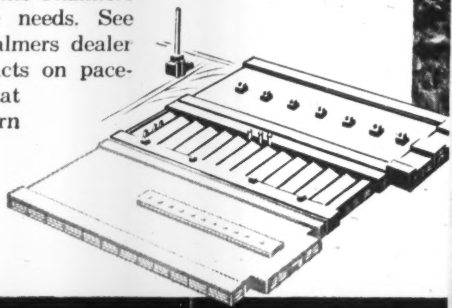
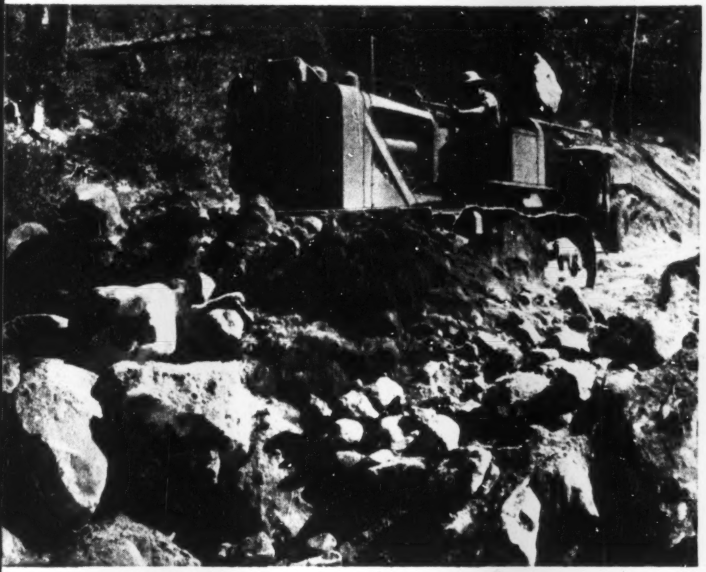
Yes, the "family circle" of users of Allis-Chalmers tractors is growing constantly. Many users who bought their first Allis-Chalmers tractor only a few years ago now have fleets of them, and many others who operate only one or two tractors have become Allis-Chalmers boosters.

This acceptance is the springboard behind a big plant expansion at Springfield, Illinois, which will enable Allis-Chalmers to meet *your* future needs. See your nearby Allis-Chalmers dealer now for the inside facts on pace-setting tractors that measure up to modern production methods.





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▲
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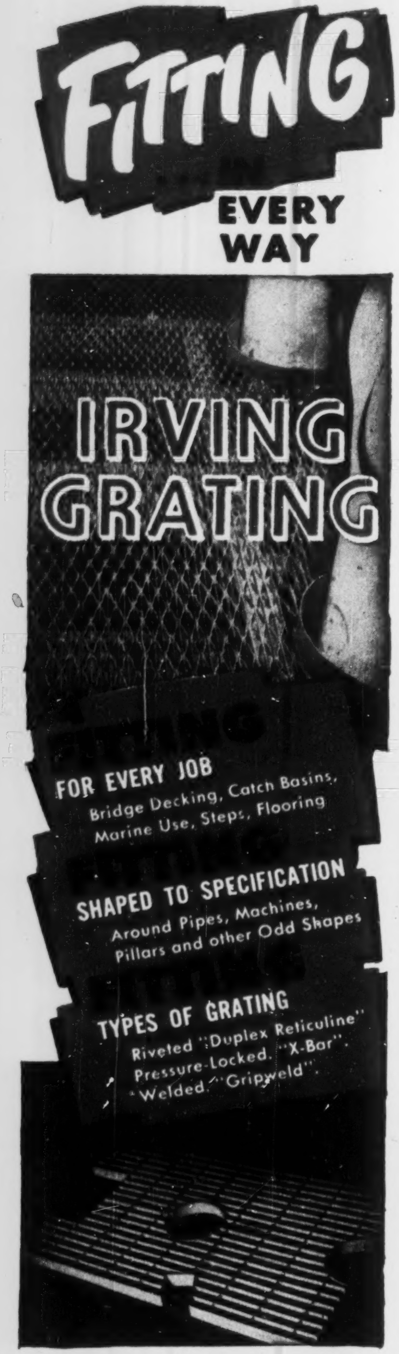

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FILMS

The Gamblers

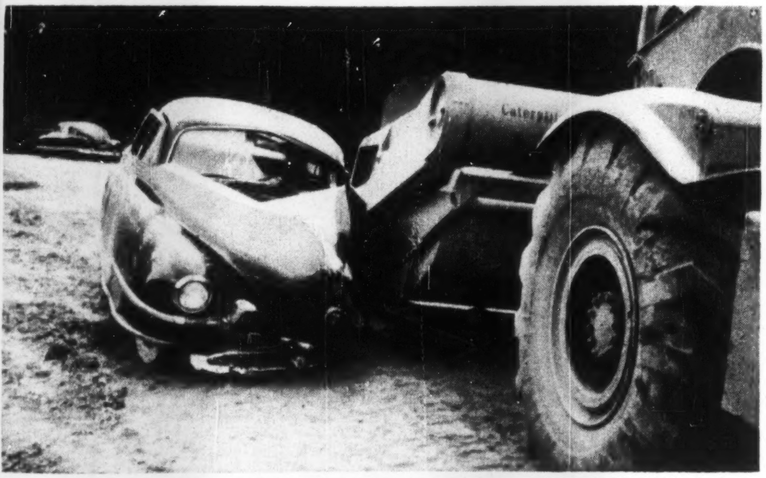
A 20-min sound-color film produced by Caterpillar Tractor Co., Peoria, Ill., and available through its dealers. Of interest to anyone concerned with the safe operation of construction equipment.

The construction industry has long needed a film on equipment safety that pulled no punches—it has one now. "The Gamblers" packs into 20 min of celluloid strip a safety lesson that shuns the usual repetition of common sense safety rules. Instead it prefers to prod construction equipment operators to think for themselves—to consider the consequences of a thoughtless action.

The film's producers realized they could not depict every conceivable type of accident—they chose those with great impact. Starting out quietly the film shows the stupidity of bulldozing at the base of a high bank supporting heavy boulders when a few minutes time could remove the threat of falling rocks. Tension and impact mount with a sequence that shows how inattention to a little detail like

(Continued on page 94)

LETHAL WEAPON in the hands of small boys since the operator left his machine without grounding the blade. Scene in "The Gamblers" shows the dropping of a dozer blade on a small boy's midsection.



AUTOMOBILE MEETS SCRAPER—the hard way. A scene in "The Gambler" shows what happens when an operator forgets to close the petcock on his air supply tank. He met this car on a grade and had no brakes.

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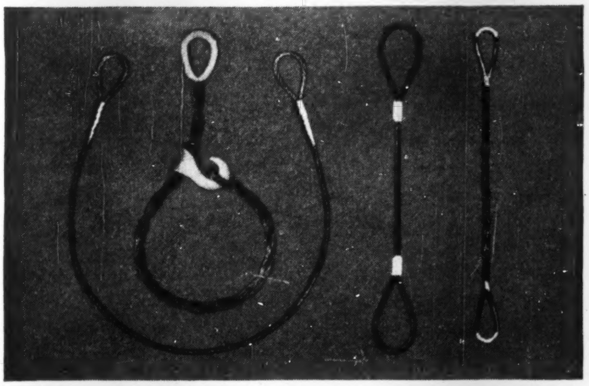

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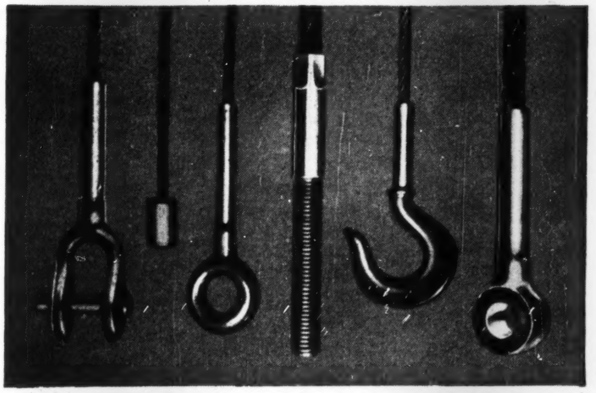

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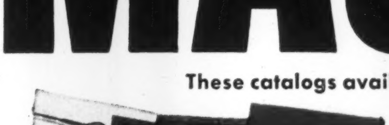

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Continuing, Mr. Cavett says: "Our success with your hot mix plant made it easy to sell us on the idea of the Moto-Paver. Our first Moto-Paver did such a good job for us the first year that we now have three. During the past two years each of these machines has worked full seasons and the only layoffs we have had have been due to lack of material."

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blocking up a scraper blade and apron before changing the cutting edge can result in a decapitated or badly mutilated mechanic. It would be impossible for anyone to be unimpressed by the scene showing the grim, sudden final dropping of the apron on the unwise but unfortunate man beneath.

The action doesn't stop there though. Through scenes showing preventable accidents—suicides might be a better word—such as the smashing of a man between his tractor and bulldozer, or the pulverizing of an operator between the ejector and rear wall of a scraper bowl, running over a man napping in the shade of a motor grader and the below the belt punch delivered to a man stepping over a tightening cable—through all of these scenes, the movie insists on the stupidity of gambling with safety.

A parallel is drawn with recurring scenes of a man playing "Russian roulette." It is pointed out that although the odds are good—five empty chambers to one loaded—there is no prize. The same is true with safety rules. Ignore them once and you may get away with it, but each time you do it cuts your chances of escape the next time by just that much.

On the whole, Caterpillar and their working partner, the Construction Section of the National Safety Council, have done an excellent job and should be congratulated twice. Once for taking a fearless stand in their presentation of the consequences of carelessness and again for eliminating commercial aspects in the presentation.

A Profit for Everyone

A 26-min, 16 mm, sound-color film demonstrating the Barber-Greene Model 840 asphalt plant. Prints may be obtained on loan from Wayne D. Adamson, Jr., Advertising Mgr., Barber-Greene Co., Aurora, Ill.

The thread of continuity in "A Profit for Everyone" is carried by an editor of a regional construction magazine who calls on a contractor using a B-G Model 840 plant. As the editor questions the contractor about the plant operation, all of the features of the various plant components are discussed and illustrated. Shown are job scenes taken in various locations throughout the world.

The film title is taken from its theme that the availability of highly portable, low cost asphalt plants has brought modern asphalt paving to remote areas with resulting profit for everyone in the field of bituminous construction.

PUBLICATIONS

Elevator buckets—Book No. 2465 describes the complete line of cast malleable and Promal elevator buckets, including Styles A, AA, AA-RB, B, C and Continuous. Fifty-five standard sizes are listed and tables give dimensions, weights and capacities. Detailed information is provided on the mounting of buckets on belts and chains. Tables and diagrams on bucket punching are also included. Various chain attachments and elevator bolts are illustrated.—LINK BELT CO., 307 N. MICHIGAN AVE., CHICAGO 1, ILL.

Superchargers—How Miehle-Dexter superchargers boost the power of diesel and gasoline engines is the subject of a new bulletin. The 4-page folder illustrates and describes the supercharger and points out that the addition of such a device to current or projected engine designs is said to be easy and is often a less costly way to obtain additional power without increasing space requirements or engine weight. A simple table and graphs are included in the folder to aid in determining the proper size unit to be used on various applications. Write for Bulletin No. 153.—MIEHLE-DEXTER SUPERCHARGER DIV., DEXTER FOLDER CO., 100 N. 4TH ST., RACINE, WIS.

Generating plants—A pocket-size booklet contains general information concerning the selection of engine-driven electric generating plants. Text material traces the history of electric plant development from early stages to modern single-unit, engine-generator power plants. Three general groups are described: alternating current, direct current and battery charging. Plant operation for each type is discussed. The booklet also reviews the three types of prime movers that furnish the mechanical power for driving the generator. Differences of engine cooling are compared, starting methods are described and a summary of important points in selection of a generating plant are included.—D. W. ONAN & SONS, INC., 2600 UNIVERSITY AVE., S.E., MINNEAPOLIS 14, MINN.

Waste pumps—A new 12-page bulletin describes municipal and industrial waste pumps. The new booklet covers features, performance information, specifications and selection data for plunger sludge pumps, mud-hog diaphragm pumps and self-priming centrifugal pumps used on sludges and slurries. Bulletin W-52.—MARLOW PUMPS, RIDGEWOOD, N. J.

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EDITORIALS

Tornadoes strike again

IN NO YEAR of recent memory have tornadoes dipped into so many sizable towns to make a mockery of man-made structures. At no time, therefore, has the challenge to architects and engineers to encourage sound design and construction been so clear-cut nor so insistent.

In June, it was Waco, Tex.; Flint, Mich.; Cleveland, Ohio; and Worcester, Mass., that were victims of the whirling, sucking air movements. Last week, Vicksburg, Miss., joined the group of damaged communities (ENR Dec. 10, p. 26). Next year there will be others; for wherever cold, dry air masses can collide with warm, moisture-laden air a tornado can be born.

In the past we have been loath to acknowledge that tornadoes were more than a regional phenomenon of the Midwest or that, since most of them touched the ground in rural areas, they were a particular menace to city dwellers. This year's experience furnishes an awakening on both scores. Tornadoes are a national menace, and cities can be hit by them. Obviously, these are not new facts; but thus given new emphasis, they explain why engineers and architects should intensify their efforts to obtain types of construction and design that will resist tornado forces better.

That these forces, at maximum, are practically irresistible often has been used as an excuse for ignoring them. Yet, in the twisted wreckage left by every tornado will be found examples of buildings or structural elements that did survive. The devastation was less complete, the loss of life less frequent when sound construction practices had been followed.

The lessons for architects and engineers are twofold —to avoid in their own structures the obvious weaknesses of poor design, and to encourage and preach the advantages of good design continuously and insistently.

With tornado damage still fresh in memory, there probably is no better time than the present to press for the replacement or reinforcement of buildings that are structurally unsafe or inadequately protected against fire. (Considerable damage at Vicksburg resulted from fire.) The very minimum that architects and engineers can do is to assure that the building-code requirements of their communities are based on the latest information and that at least the structural and fire-protection requirements are made retroactive. Furthermore, building inspectors and the courts should be impressed with the importance of enforcing these requirements.

Following the great Florida hurricane of 1928, the technical fraternity in that region set about doing some of these things with increasing purpose. So well did their missionary zeal pay off that it is doubtful whether any hurricane can ever exact damage comparable with 1928 again. The much greater velocities and the vacuum and torsional effects of tornadoes are not so easily resisted as hurricanes. But an improvement in resisting them is possible—and practicable economically. It is one of the profession's public service jobs to give every encouragement to the achievement of this improvement.

River regulating troubles

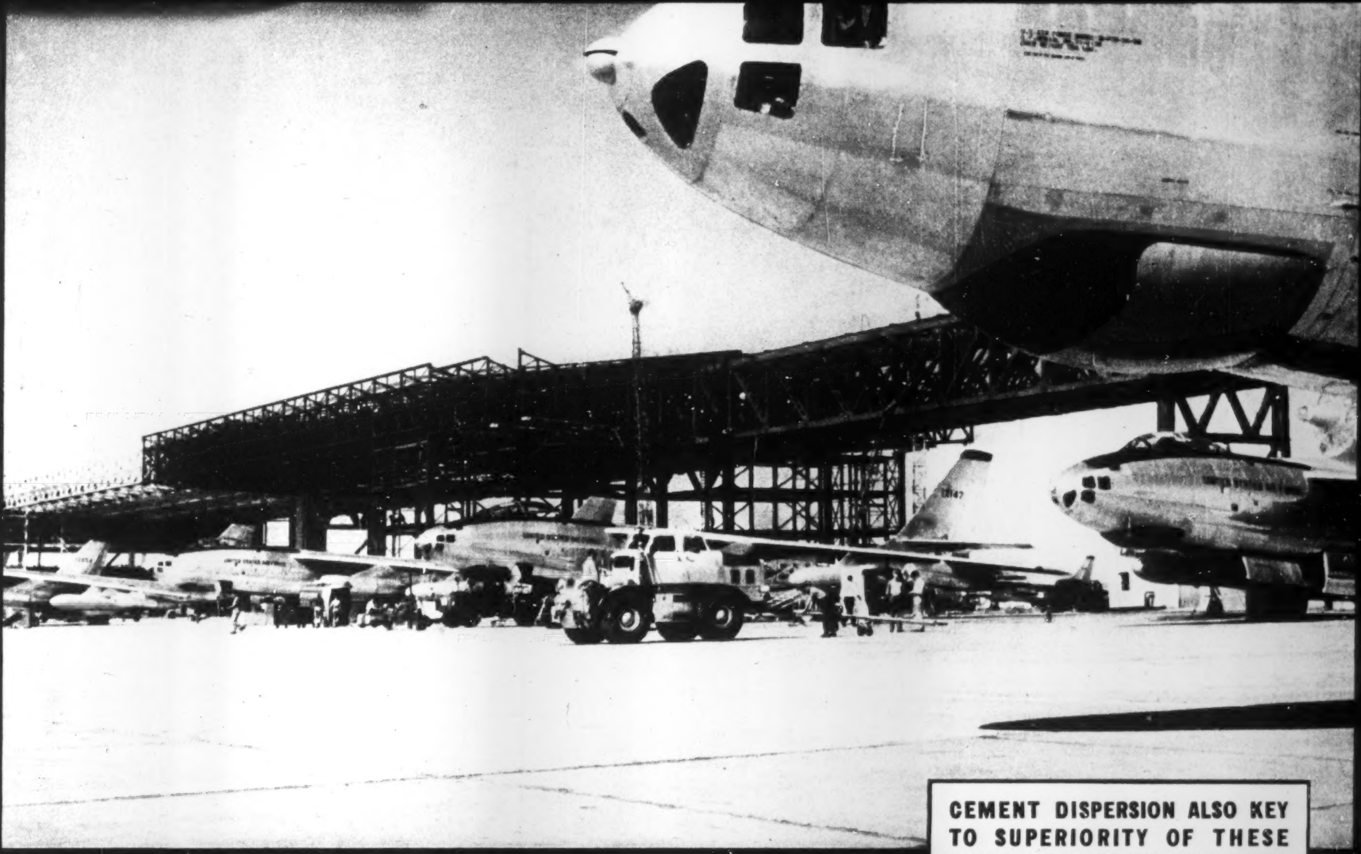
LINCOLN'S famous observation about being able to fool all the people some of the time applies to action taken by New York State voters at the recent election that is of interest to engineers concerned with river development in other parts of the country. As a result of an extensive campaign of newspaper publicity, voters amended the state's constitution to make it impossible for any one of the state's river regulating districts to use any part of the state's vast Adirondack forest reserve as a site for a storage reservoir.

The trouble started when one of those districts sought to flood about 900 acres of the two million acres in the state forest to form part of a storage reservoir. Unfortunately for the district, the same reservoir required about 3,000 acres of land belonging to the Adirondack League Club, a private organization owning some 100,000 acres of forest and small lakes adjoining the state forest. The district could condemn that land, but if the club could block its acquisition of state land, the whole project would be abandoned.

Hence the campaign to get the state's constitution amended to prevent the "power interests" from invading the forest reserve. Obviously, the campaign had public appeal; fishing clubs and recreational groups took the ball once the idea had been launched. Overlooked was the fact that while power companies would benefit from better stream flow, so would the communities in valleys of rivers having their headwaters in the forest reserve, because more power means better business, and because the reservoirs would reduce flood damage, which frequently is high. Those communities were participants in the plan to the extent of their flood-control benefits.

Actually, also, the proposed reservoir would have had much more recreational value to the people of the state than the small fraction of the vast forest area required for its construction. We surmise that study of this subject by an impartial body would indicate that the forest would benefit—as well as the people—by the construction of more reservoirs on streams rising in the forest reserve. But that now would require another constitutional amendment.

The lesson for engineers appears to be that much of the planning for projects involving the public may be wasted if the planning does not anticipate probable objections from the public and, if possible, make provision for enlisting support from public bodies early in the undertaking.



Boeing Airplane Co., Wichita, Kansas. Pozzolith Concrete used in apron and hangar Consltg. Engr. — Wilson & Co., Salina, Kansas; Hangar Contr.—Manhattan Construction Co., Inc., Muskogee, Okla.; Hangar concrete supplied by Walt Keeler Concrete Co., Wichita, Kansas; Apron Contr.—Peter Kiewit & Sons Co., Wichita, Kansas, who also produced the concrete for apron.

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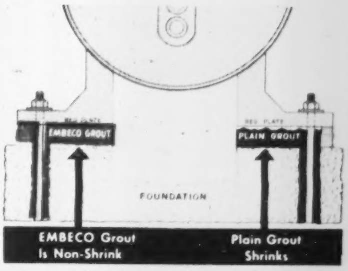

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